STATE OF MINNESOTA DISTRICT COURT 09:10:00

COUNTY OF RAMSEY SECOND JUDICIAL DISTRICT

- -

THE STATE OF MINNESOTA,
BY HUBERT H. HUMPHREY, III,
ITS ATTORNEY GENERAL

AND

BLUE CROSS AND BLUE SHIELD OF
MINNESOTA,
PLAINTIFFS,
FILE NO. C1-94-8565

VS.

PHILLIP MORRIS INCORPORATED, R.J.
REYNOLDS TOBACCO COMPANY, BROWN &
WILLIAMSON TOBACCO CORPORATION,
B.A.T. INDUSTRIES P.L.C., LORILLARD
TOBACCO COMPANY, THE AMERICAN
TOBACCO COMPANY, LIGGETT GROUP, INC.,
THE COUNCIL FOR TOBACCO RESEARCH-U.S.A.,
INC., AND THE TOBACCO INSTITUTE, INC.,
DEFENDANTS.
- -

VOLUME I

DEPOSITION OF

RICHARD HURT, M.D.

August 19, 1997

9:10 a.m.

REPORTED BY: KATHY L. SOPER
RPR, CSR, CALIF. CSR 8519
620 PLYMOUTH BUILDING
MINNEAPOLIS, MINNESOTA 55402

DEPOSITION OF RICHARD HURT, VOLUME I,

taken at the Law Offices of Robins, Kaplan, Miller & Ciresi, 2800 LaSalle Plaza, Minneapolis, Minnesota 55402, commencing at 9:10 a.m., on the 19th day of August, 1997, before Kathy L. Soper, a Notary Public and Certified Professional Reporter.

* * * *

A P P E A R A N C E S

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On Behalf of the witness:

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BY: Michael Berens

ALSO PRESENT: John Ramonetti
Legal Assistant
Chadbourne & Parke, LLP

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VIDEOGRAPHER: Good morning. We are on the video record. Today's date is August 19, 1997. The time is now 9:10 a.m. My name is Dave Jenkins, a video technician associated with J. Lerschens and Associates. 09:10:40 09:10:44 09:10:50 09:10:52 09:10:52

Today's witness is Dr. Richard Hurt. 09:10:56

May we have the introduction of counsel followed by the swearing in of the witness. 09:10:58 09:11:00

MS. WALBURN: Roberta Walburn, Robins, Kaplan, Miller & Ciresi on behalf of the plaintiffs. 09:11:04 09:11:06 09:11:06

MR. WILSON: Gary Wilson, same firm, on behalf of the plaintiffs. 09:11:10 09:11:10

MR. BERENS: Mike Berens, Kelly & Berens. I represent Dr. Hurt. 09:11:12 09:11:14

MR. PURDY: Larry Purdy, Maslon, Edelman, Borman & Brand, Minnesota counsel for CTR. 09:11:18 09:11:18

MR. LOSS: Greg Loss, counsel on behalf of British-American Tobacco Company and Batuke. 09:11:22 09:11:24

MS. AUGUST: Gretchen August, Gray, Plant, Mooty representing R.J. Reynolds. 09:11:26 09:11:30

MS. WALBURN: Excuse me. Can we get the law firms that each person is -- are with? 09:11:32 09:11:36

MR. LOSS: Greg Loss with Chadbourne & Parke. 09:11:36

MR. DARLING: Tom Darling, Gray, Plant, Mooty for R.J. Reynolds. 09:11:40 09:11:40

MR. McDONNELL: Alf McDonnell, Arnold & Porter, Denver, for Philip Morris. 09:11:44 09:11:46

MR. GALE: Todd Gale with Kirkland & Ellis. I represent Brown & Williamson. 09:11:48 09:11:48

MR. KEMNA: Don Kemna, Shook, Hardy & Bacon, for Lorillard. 09:11:50 09:11:52

MR. NIMS: Mike Nims, Jones, Day, Reavis & Pogue, R.J. Reynolds Tobacco Company. 09:11:54 09:11:58

MR. PETERSONS: Arvids Petersons, Lorillard Tobacco, Shook, Hardy & Bacon. 09:11:58 09:12:02

THE WITNESS: Who is the guy at the end?

That one.

MR. RAMONETTI: Yes. John Ramonetti, Chadbourne, for B.A.T. Co., litigation assistant. 09:12:10 09:12:14

MR. NIMS: Do you want to swear the witness?

RICHARD D. HURT, M.D.,

called as a witness, was duly sworn and testified as follows:

EXAMINATION 09:12:26

BY MR. NIMS:

Q. Would you state your name for the record, sir. 09:12:30

A. My name is Richard Hurt. 09:12:30

Q. And by whom are you currently employed? 09:12:32

A. Mayo Clinic. 09:12:34

Q. And I take it you are a doctor? 09:12:36

A. That's correct. 09:12:36

Q. Let me hand you, Dr. Hurt, what's been provided to us as your expert report in this case. 09:12:48 09:12:52

A. All right. 09:12:52

MR. NIMS: If we could have that marked as 09:13:00

an exhibit. 09:13:00

(Defendants' Deposition Exhibit 2451 was marked 09:13:10
for identification.) 09:13:22

BY MR. NIMS:

Q. Could you identify that for us, Doctor. 09:13:24

A. That is my report. 09:13:26

Q. And you, personally, prepared that? 09:13:28

A. That's correct. 09:13:28

Q. Were there any prior drafts of that? 09:13:32

A. There were. 09:13:32

Q. How -- could you describe for me the process by 09:13:38
which you ultimately created the document that we 09:13:42
have in front of us today. 09:13:42

MS. WALBURN: Objection, form, vague and 09:13:44
since we are getting into an area that obviously may 09:13:48
involve privileged communications, I would ask that 09:13:52
the questions be more focused. 09:13:52

THE WITNESS: So should I answer, or not? 09:14:00

MS. WALBURN: If you -- 09:14:00

MR. NIMS: I am satisfied with the 09:14:02
question. 09:14:02

MS. WALBURN: If you are able to answer, 09:14:04
you can answer. Again, I would caution both counsel 09:14:06
and Dr. Hurt to not be wandering into areas of 09:14:12
privileged communication. 09:14:14

THE WITNESS: So do you want to know -- 09:14:16
what do you want to know about the report as far as 09:14:20

the way I prepared it, would be my question. 09:14:22

BY MR. NIMS:

Q. Well, we have a document which we have marked as an exhibit in front of us today. 09:14:24 09:14:26

A. Correct. 09:14:36

Q. Which I guess does not bear a date. You have indicated there were prior versions of this report? 09:14:40 09:14:46

A. That's correct. 09:14:48

Q. Do you still have those? 09:14:50

A. No, I do not. 09:14:50

Q. What happened to them? 09:14:52

A. When I prepare reports, practically any type, like papers or this report, I work from the previous draft, make modifications to it, and then I discard the previous draft. I don't -- there is too much paper to keep track of all that. 09:14:56 09:15:00 09:15:04 09:15:06 09:15:08

Q. Do you recall approximately when you first had a draft of the document that we have in front of us today? 09:15:12 09:15:16 09:15:16

A. Approximately eight months or so, maybe nine months ago. I can't remember exactly. 09:15:22 09:15:24

Q. And did you prepare that first draft yourself? 09:15:28

A. That's correct. 09:15:28

Q. Are you able to tell me what changes there are between that draft you prepared eight or so months ago and the one we have in front of us today? 09:15:34 09:15:36 09:15:38

MS. WALBURN: Objection, form and, also, counsel, to the extent that you are inquiring into 09:15:40 09:15:42

this area, you will be, by your questions, allowing the same exact inquiry of expert witnesses for the tobacco industry. You just should be aware of that as you proceed. 09:15:50 09:15:54 09:15:58 09:16:00

MR. NIMS: Well, do I understand, counsel, that if I don't inquire into his prior drafts, it would not be the intention of plaintiffs' counsel to inquire into prior drafts of defendants' experts' reports? 09:16:02 09:16:08 09:16:10 09:16:14 09:16:14

MS. WALBURN: Well, there has already been inquiry in the depositions about prior drafts in previous depositions, but the contours of that is a different question. 09:16:18 09:16:20 09:16:26 09:16:26

If defense counsel would like to reach a bilateral agreement as to the proper parameters of this type of questions, we would be more than willing to sit down and work that out. 09:16:28 09:16:32 09:16:34 09:16:36

Your questions in this area are objectionable because of the breadth of that, and I just want to put you on notice. If you want to sit down and work out a bilateral stipulation in this area we would be happy to do that. 09:16:38 09:16:42 09:16:46 09:16:48 09:16:50

In the absence of that, any questions that you ask and that are -- we allow this witness to answer, you will have waived any claims of privilege or work product on behalf of the defendants. 09:16:52 09:16:56 09:17:02 09:17:04

MR. NIMS: I don't understand how my 09:17:12

questioning could waive things on behalf of the defendants, but I appreciate your statement. 09:17:14 09:17:20

BY MR. NIMS:

Q. Other than attorneys representing the plaintiffs in this lawsuit, Dr. Hurt, did you obtain the assistance of anyone in preparing your report? 09:17:26 09:17:30 09:17:32

MS. WALBURN: Objection, form. 09:17:36

THE WITNESS: The work that I did here, I did with -- I put together the initial draft of the report and probably several other drafts in between, and then with the assistance of the attorneys, put it into the legal jargon that is required by you all as far as having a report that you can relate to. 09:17:42 09:17:46 09:17:52 09:17:56 09:18:00 09:18:06

BY MR. NIMS:

Q. As the report is in front of us today and has been marked, are you satisfied that it is a complete and accurate summary of the opinions that you intend to express in this litigation? 09:18:10 09:18:14 09:18:18 09:18:20

A. This report is my opinion regarding this case. We obviously will be reviewing other documents as time goes on, but this is the basis of my report. 09:18:26 09:18:30 09:18:34

Q. We have had this report for two and a half months, roughly. Do you know at this time that there are things you presently intend to add to it? 09:18:42 09:18:46 09:18:48

A. I do not know of any at the present time, but things change. We will review more documents. Science continues to advance. I do not know. 09:18:54 09:18:58 09:19:02

MS. WALBURN: And as you know, counsel, we provided you with a couple supplemental letters. 09:19:04 09:19:06

MR. NIMS: Additional things that he has seen, yes, I am aware of that. 09:19:08 09:19:14

BY MR. NIMS:

Q. Do you understand that you have any ongoing assignment with respect to the possibility of adding things to this report? 09:19:16 09:19:24 09:19:24

A. I don't know what you mean by an "ongoing assignment." What does that mean? 09:19:28 09:19:30

Q. Have the plaintiffs' lawyers told you that your job is not done and that they want you to do other things, or as far as you know, is your job done? 09:19:32 09:19:36 09:19:40

A. Well, I think my job really isn't done until after the trial, and so as it relates to that, this will go on into the future. 09:19:44 09:19:50 09:19:54

Q. Do you understand that you have any specific assignment that you are presently undertaking to determine whether you want to add something to this? 09:19:56 09:20:00 09:20:02

A. No, I do not have any particular assignment at the present time. 09:20:06

Q. And just to make sure, I believe you have already answered this, but so far as you know, at the present time you know of nothing that you would add to this report? 09:20:12 09:20:18 09:20:20 09:20:20

MS. WALBURN: Objection, asked and answered. 09:20:22 09:20:22

THE WITNESS: Yeah, I think I did answer that. As far as I know right now, there is nothing else to add, but times change, more documents will be reviewed, because there is a lot of documents that are out there that I have not reviewed as yet and they could very well be very important. 09:20:24 09:20:26 09:20:28 09:20:30 09:20:34 09:20:38

BY MR. NIMS:

Q. Doctor, you believe, I think it's fair to say from your report, that cigarette smoking is properly labeled an addiction, do you not? 09:20:46 09:20:48 09:20:50

A. Nicotine is the addicting substance in cigarette smoke and it is nicotine delivered by cigarettes that gives it the addictive nature for cigarettes. 09:20:54 09:20:58 09:21:02

The cigarette is the most efficient delivery form of nicotine that exists. It's better than IV, if you will. 09:21:06 09:21:08 09:21:10

So yes, it's nicotine is the addictive substance and the cigarette is the drug delivery device. 09:21:12 09:21:14 09:21:16

Q. Does that mean that you wouldn't consider it accurate to say that cigarette smoking is addictive but that it's more accurate to say, in your opinion, nicotine is addictive? 09:21:20 09:21:24 09:21:28 09:21:30

MS. WALBURN: Objection, form. 09:21:32

THE WITNESS: Nicotine is the addictive 09:21:34

substance. Cigarettes are the delivery system for that drug. Nicotine is a drug, and cigarettes are the delivery system. 09:21:38 09:21:40 09:21:42

They are very efficient at getting nicotine to the brain at very high levels and the delivery system, itself, has to do with the addictive potential of any drug and especially this one. 09:21:44 09:21:46 09:21:48 09:21:52 09:21:52

BY MR. NIMS:

Q. Would you call cigarette smoking an addiction? 09:21:56

A. Cigarette smoking as it relates to nicotine is an addictive substance. If you take the nicotine out of cigarettes, which it's possible to do, then I don't think that you would -- you would get people to continue to smoke because nicotine is the driving force behind the addictive nature of cigarettes. 09:21:58 09:22:04 09:22:08 09:22:10 09:22:14 09:22:18

Q. When you use the term addiction, Doctor, what do you mean by it? 09:22:24 09:22:24

A. I use, as I have said in the report, the DSM-IV form criteria for addictive substances. 09:22:28 09:22:32

Q. Could you tell me where DSM-IV defines the term addiction. 09:22:40 09:22:40

A. Where meaning what? 09:22:44

Q. Where within the confines of DSM-IV? I mean, it's a several hundred page manual but I must admit I am not aware of anyplace in that manual that it provides us with a definition of addiction. 09:22:48 09:22:54 09:22:58 09:23:02

MS. WALBURN: Objection, form. 09:23:04

BY MR. NIMS:

Q. Where in that manual do you understand DSM to define the term addiction? 09:23:06 09:23:06

A. Well, I would have to look at the manual, and I don't have the manual in front of me, in order to be able to tell you exact page numbers, if that's what you have want to know. If you have got the manual, I am glad to look at it and show it to you. 09:23:08 09:23:10 09:23:14 09:23:16 09:23:18

Q. No, I didn't bring it with me unfortunately. It's your recollection that someplace within that manual you believe it defines the term addiction? 09:23:20 09:23:22 09:23:24

MS. WALBURN: Objection, asked and answered. 09:23:26 09:23:28

THE WITNESS: It does that. And where in there I can't tell you exact page numbers, but it is there. 09:23:30 09:23:36 09:23:38

BY MR. NIMS:

Q. And it is that definition of addiction that you believe is the appropriate one? 09:23:40 09:23:42

A. That is the definition that's the working definition 09:23:42

that we use to classify all substances of dependence or addiction, whichever term you want to use. Those terms are synonymous to me and to the rest of the profession. 09:23:46 09:23:50 09:23:52 09:23:52

Q. Well, that I guess raises another question. Can you tell me where you believe within DSM-IV, if it does, that DSM-IV says the term dependence is synonymous 09:23:56 09:24:02 09:24:08

with the term addiction? 09:24:10

A. I would have to look and see if it's written there. 09:24:12

I don't have the book in front of me. 09:24:14

Q. Do you believe that somewhere within that manual it says the terms are synonymous? 09:24:16 09:24:18

A. I would have to see the book. You just said that it's a long book, a lot of pages, and without it in front of me, I couldn't -- couldn't proclaim that. 09:24:22 09:24:24 09:24:28

Q. So without the book in front of you, you don't know whether it says the terms are synonymous, addiction and dependence? 09:24:32 09:24:36 09:24:36

MS. WALBURN: Objection, asked and answered. 09:24:38 09:24:38

THE WITNESS: I would have to see the book. 09:24:40 09:24:40

BY MR. NIMS:

Q. So my question is without the book, you don't know? 09:24:42

MS. WALBURN: Objection, asked and 09:24:44

answered. 09:24:46

THE WITNESS: I think I have answered that. I would have to see the book. 09:24:46 09:24:50

BY MR. NIMS:

Q. Well, I will take that as without the book you don't know. 09:24:52 09:24:54

MS. WALBURN: Well, I move to strike counsel's comments. 09:24:54 09:24:56

THE WITNESS: That's not what I said, so 09:25:00

you can say what you want to say. 09:25:02

BY MR. NIMS:

Q. If I misunderstood, then answer my question. 09:25:04

Without the book, do you know whether DSM-IV, anywhere within its confines, says that the term dependence is synonymous with the term addiction? 09:25:06 09:25:12 09:25:14 09:25:16

MS. WALBURN: Objection, asked and answered on multiple occasions. 09:25:18 09:25:20

MR. NIMS: No, he just told me -- I thought it was answered, but he told me I had it wrong and I don't want to have it wrong. I want to know what the doctor says. 09:25:22 09:25:22 09:25:24 09:25:26

THE WITNESS: I would have to see the book. 09:25:28 09:25:28

BY MR. NIMS:

Q. So without the book, the answer is you don't know? 09:25:30

MS. WALBURN: Well, counsel, if you have the book, perhaps we can -- 09:25:34 09:25:34

MR. NIMS: I don't have the book. If you have the book I will be happy to put it in front of him. His report says he is familiar with DSM-IV, but I don't have it with me. 09:25:36 09:25:38 09:25:42 09:25:42

MS. WALBURN: I don't believe there is a pending question. 09:25:48 09:25:48

MR. WILSON: There is no question. 09:25:50

MR. NIMS: Well, I think there is a pending question, but I will ask it again. 09:25:52 09:25:54

BY MR. NIMS:

Q. Without the book, Doctor, can you tell me whether you believe DSM-IV anywhere within its confines says that the term dependence is synonymous with the term addiction? 09:25:56 09:26:02 09:26:06 09:26:06

MS. WALBURN: Objection, asked and answered. 09:26:08 09:26:08

MR. NIMS: I am trying. 09:26:08

THE WITNESS: I would have to see the book. 09:26:10 09:26:10

MR. NIMS: I will take that, then, as a he can't tell me without the book. 09:26:12 09:26:14

MS. WALBURN: Well, that's not the proper question and we will move at the proper time to strike counsel's comments. 09:26:16 09:26:18 09:26:20

MR. NIMS: You have done that a lot and we are only 20 minutes in. 09:26:22 09:26:24

BY MR. NIMS:

Q. So without the book, you don't know? 09:26:26

MS. WALBURN: Objection. 09:26:28

BY MR. NIMS:

Q. That's all I want to know. 09:26:28

MS. WALBURN: Asked and answered. 09:26:30

MR. NIMS: It's not a difficult question. 09:26:30

MS. WALBURN: And you had an answer now on more occasions than I can count. 09:26:32 09:26:38

BY MR. NIMS:

Q. You don't know, correct? 09:26:38
A. I would have to see the book. 09:26:40
Q. You regard the terms as synonymous? 09:26:42
A. That's correct. That's what my report says right here. 09:26:46
Q. What is your basis, other than perhaps DSM-IV, which either does or does not say that? What is your basis for believing that the terms are synonymous? 09:26:50
MS. WALBURN: Objection, form. 09:27:00
THE WITNESS: You know, I have had probably 20 years of experience dealing with 09:27:02

addiction and dependence. 09:27:08
The experience goes back to my training, it goes back to seeing thousands of patients, it goes back to doing research on nicotine addiction or dependence, and we basically, in the field of nicotine addiction or dependence, use those terms synonymously. 09:27:12 09:27:16 09:27:20 09:27:22 09:27:26 09:27:28
For example, when we tried to decided what to call our first national conference on nicotine dependence, we decided to call it that, rather than to call it addiction. 09:27:30 09:27:32 09:27:36 09:27:38
We had a discussion and a debate amongst the group of scientists that were involved in that meeting, and in that instance we decided to call it dependence. 09:27:40 09:27:42 09:27:46 09:27:46
In the textbook written by Orleans and Slade, of which I contributed a chapter, we had the 09:27:50 09:27:52

same discussion and they polled all the authors and asked which -- what we should call this, and it was decided to call it nicotine addiction. 09:27:56 09:28:00 09:28:04

The terms are synonymous, as far as nicotine addiction or nicotine dependence, they are synonymous. And that's the basis for that. I mean, I could -- it's broad, it's long, it's deep. 09:28:06 09:28:10 09:28:14 09:28:18

BY MR. NIMS:

Q. Well, let me be sure I understand your basis. Your basis includes your experience with patients, you said, and your basis includes a decision that some group of people made when they had a conference. 09:28:22 09:28:26 09:28:32 09:28:36

Who was that? 09:28:38

A. That's just an example of -- 09:28:40

Q. Who was -- 09:28:40

A. -- of the -- that's just an example of the thought process that goes into what you term something. 09:28:44 09:28:48

The definitions that we use are the ones that are in DSM-IV that have to do with tolerance, withdrawal, all of those things that are listed in DSM-IV as outlined in my report. And whether you call it dependence or addiction, it's really -- they are synonymous terms. 09:28:56 09:28:56 09:28:58 09:29:02 09:29:08 09:29:10

Q. I clearly understand you regard them as synonymous, and you certainly have made that point and I understand that. I just want to understand what the basis of your belief that they are synonymous is. 09:29:14 09:29:18 09:29:22 09:29:26

Your experience with patients, I take it, doesn't really shed any light on the definition of those terms. 09:29:30 09:29:36 09:29:36

I mean, it enables you to form views about how difficult you believe it is to change the behavior, but it doesn't really define the term for 09:29:42 09:29:44 09:29:46

us. 09:29:48

Is that fair? 09:29:48

MS. WALBURN: Objection, form. 09:29:50

THE WITNESS: There is a lot of things in there. Can you be a little bit more specific as far as what you want to know? I mean, that's a long question. 09:29:52 09:29:54 09:29:56 09:29:58

BY MR. NIMS:

Q. I am merely trying to break down what you told me your basis was. The first thing you told me was it was your experience with patients. 09:30:00 09:30:04 09:30:04

Is it fair to say that your experience with patients doesn't really shed any light on what the appropriate definition of the term dependence is or the appropriate definition of the term addiction is? 09:30:06 09:30:10 09:30:14 09:30:16 09:30:18

It certainly gives you a basis for views on behavior, but it doesn't tell us what those terms mean; is that fair? 09:30:20 09:30:22 09:30:24

MS. WALBURN: Objection, asked and answered and form. 09:30:26 09:30:28

THE WITNESS: Yeah, there is several 09:30:30

23 questions there. If you can give me more specific 09:30:32
24 and get down -- 09:30:34
25 BY MR. NIMS:

1 Q. I think there is a very precise question there. Can 09:30:36
2 you answer it? 09:30:38
3 MS. WALBURN: Objection, form. 09:30:40
4 THE WITNESS: I need more specifics 09:30:42
5 than -- 09:30:42
6 BY MR. NIMS:
7 Q. You can't answer the question as I asked it? 09:30:44
8 A. Your question has too many parts to it. 09:30:46
9 Q. Well, take the first part. What do you think the 09:30:48
10 first part of my question is? 09:30:50
11 A. I have no idea. 09:30:52
12 MS. WALBURN: Objection, form. 09:30:52
13 BY MR. NIMS:
14 Q. You have no idea what the first part of my question 09:30:54
15 is? 09:30:54
16 MS. WALBURN: Excuse me, counsel. I would 09:30:56
17 appreciate it if you are not talking over me when I 09:31:00
18 am raising a question. 09:31:00
19 MR. NIMS: It would be hard for me to talk 09:31:02
20 and not talk over you when you are making an 09:31:06
21 objection. 09:31:06
22 MS. WALBURN: Well, why don't you try and 09:31:08
23 do your best. 09:31:08
24 MR. NIMS: I am trying to do my best and I 09:31:12

25 am also mindful of your setting the standards for 09:31:14

depositions, as you told me I was. 09:31:18

BY MR. NIMS:

Q. Now, Doctor, let me try again. 09:31:20

Your experience with patients doesn't tell us much about the official definition of addiction versus dependence, does it? 09:31:22 09:31:28 09:31:30

A. I am not sure what an official definition is. I mean, what -- can you be -- can you tell me what you are talking about? 09:31:34 09:31:40 09:31:42

Q. Well, I would be happy to. Do you think there is an official definition of the term addiction? 09:31:44 09:31:46

A. There is an accepted definition of dependence or addiction, and that's what I just explained was in DSM-IV, the American Psychiatric Association's definition of psychoactive substance dependence is in DSM-IV. 09:31:50 09:31:54 09:31:58 09:32:02 09:32:04

Q. So your belief is that the best generally-accepted definition of the term addiction is found in DSM-IV? 09:32:08 09:32:14

A. The term as far as addiction or dependence is synonymous, and DSM-IV describes what we are talking about as psychoactive substance dependence or addiction; that's the definition. 09:32:20 09:32:26 09:32:30 09:32:32

Q. Do you know of any other generally-accepted definitions of the term addiction other than the one you believe can be found in DSM-IV? 09:32:38 09:32:40 09:32:44

MS. WALBURN: Objection, form. 09:32:46

THE WITNESS: The one that I used for my report and the one that we use for our work is the DSM-IV criteria. 09:32:48 09:32:52 09:32:54

And as far as I can tell, nicotine dependence or nicotine addiction is endorsed by every health and science -- part of the health and science community, and the only people that would not define nicotine addiction -- or nicotine as an addicting substance is the tobacco industry and its supporters. 09:32:56 09:33:00 09:33:06 09:33:08 09:33:12 09:33:14 09:33:16

BY MR. NIMS:

Q. Doctor, if you will listen to my question -- 09:33:18

A. I am trying. 09:33:18

Q. -- I think it will be helpful. 09:33:20

I didn't ask for those people who believe tobacco use is addictive. I am glad that you provided me with that list, but that isn't my question. 09:33:22 09:33:30 09:33:32 09:33:32

My question is, do you believe there is any other generally-accepted definition of the term addiction other than the one you believe is contained within DSM-IV? 09:33:34 09:33:40 09:33:42 09:33:46

MS. WALBURN: Objection, form and asked and answered. 09:33:48 09:33:48

MR. NIMS: It has been asked. It hasn't been answered. 09:33:50 09:33:52

THE WITNESS: DSM-IV is the accepted criteria for nicotine addiction or nicotine dependence. 09:33:54 09:33:56 09:33:56

BY MR. NIMS:

Q. So you don't believe there is any other generally-accepted definition? 09:33:58 09:34:00

A. DSM-IV is the accepted standard for the definition of nicotine addiction or nicotine dependence. 09:34:04 09:34:08

Q. And the whole world agrees with that? 09:34:10

MS. WALBURN: Objection, form, asked and answered. 09:34:12 09:34:12

THE WITNESS: I am not sure you get the whole world to agree on much of anything. 09:34:16 09:34:20

BY MR. NIMS:

Q. DSM-IV describes a series of criteria for the diagnosis of dependence, does it not? 09:34:40 09:34:44

A. There are seven criteria in DSM-IV for the definition of dependence or addiction, that's correct. 09:34:50 09:34:54

Q. Were you part of developing those criteria? 09:34:58

A. No. 09:34:58

Q. Do you know who was? 09:35:00

A. I don't know who was. There was a committee from 09:35:02

the American Psychiatric Association that defined this, much like they did the DSM-III and the DSM-IIIR criteria, but I don't know specifically 09:35:06 09:35:08 09:35:12

who. 09:35:14

Q. Did you have any input into development of those criteria? 09:35:16

A. You know, I can't recall. We get a lot of requests for a lot of different things as far as input for like the HCPR guidelines on nicotine dependence, and so on. 09:35:22

I don't recall if I did or did not have an early draft of DSM-IV. I can't remember. I could have, because that happens fairly frequently. 09:35:28

The HCPR guidelines or the American Psychiatric Association Guidelines for smoking cessation and nicotine dependence treatment, I recall doing that, but that was more recent than this. 09:35:30

It's possible that I could have had input into that, but I just -- I really don't remember. 09:35:42

Q. As you used the term addiction, does it require the administration of a drug? 09:35:50

A. A drug is a key part of addictive disorders or dependence-producing substances. The drug is a key part to that, yes. 09:35:56

Q. And why do you believe that to be so? 09:36:06

A. That's what we are talking about. We are talking about drug dependence, and nicotine is a drug that produces a dependent state, withdrawal symptoms, tolerance, all those other things. So the drug is 09:36:08

central to an addictive disorder. 09:36:40

Q. Well, you say it is because that's what we are talking about. But is it because there is a scientific reason why a drug is necessary for what you believe to be an addictive condition? 09:36:44 09:36:50 09:36:54 09:36:58

MS. WALBURN: Objection, misstates the prior testimony. 09:37:00 09:37:00

THE WITNESS: We are talking about a drug and so we are talking about drug dependence or drug addiction and that's the central part. A drug is a central part to that -- to an addiction. 09:37:04 09:37:06 09:37:08 09:37:12

BY MR. NIMS:

Q. The common use out there of the term addiction includes behaviors that don't involve the drug, isn't that true? 09:37:20 09:37:24 09:37:26

MS. WALBURN: Objection, form. 09:37:26

THE WITNESS: I don't know what common use you are talking about. What -- can you give me some examples of that? 09:37:28 09:37:30 09:37:32

BY MR. NIMS:

Q. Have you ever seen Internet use referred to as an addiction? 09:37:36

A. I don't recall. 09:37:38

Q. You don't recall whether you have ever seen that? 09:37:42

MS. WALBURN: Objection, asked and answered. 09:37:44 09:37:44

BY MR. NIMS:

Q. Do you believe Internet use would properly be 09:37:48

characterized as an addiction if it had become a compulsive behavior? 09:37:50 09:37:52

A. No. 09:37:52

Q. Could food disorders properly be characterized as addictions if they had become compulsive behaviors? 09:38:00 09:38:04

A. Compulsive behaviors is part of an addiction, but you need to have as part of that definition a drug. A drug is a central part to that. And in this case we are talking about nicotine, which is the central drug, the driving force behind nicotine addiction. 09:38:08 09:38:12 09:38:14 09:38:16 09:38:20

Q. Are compulsive behaviors involving drugs necessarily harder to change than compulsive behaviors not involving drugs? 09:38:24 09:38:26 09:38:28

A. I am not sure that there has ever been a comparison, scientific comparison to answer your question, as far as some compulsive behaviors are difficult to deal with. 09:38:34 09:38:38 09:38:42 09:38:42

The drug being a central part of nicotine addiction is -- it makes that part of that compulsive behavior very, very difficult. 09:38:44 09:38:48 09:38:52

People continue to use this drug in that form despite having lung cancer, heart disease, emphysema, and so on. That's a very difficult thing to do. 09:38:54 09:39:00 09:39:02 09:39:02

Q. Again, my question, Doctor, is, are compulsive behaviors that don't involve a drug easier to change as you view them because they don't involve a drug 09:39:06 09:39:12 09:39:16

than compulsive behaviors that do involve a drug? 09:39:18

MS. WALBURN: Objection, asked and 09:39:20

answered. 09:39:20

THE WITNESS: Yeah, I think I have already 09:39:22

answered that because -- 09:39:24

BY MR. NIMS:

Q. No, you told me about lung cancer and emphysema, but 09:39:26

you didn't answer my question. 09:39:28

MS. WALBURN: Excuse me, counsel, but I 09:39:30

would appreciate it if you wouldn't interrupt the 09:39:32

witness. 09:39:32

THE WITNESS: Yeah, I think I did answer 09:39:34

that because what I said was -- we can have it read 09:39:36

back if you want, but I think I said that -- I am 09:39:40

not aware of any scientific comparison between 09:39:42

compulsive behaviors with or without a drug and how 09:39:44

difficult it is to manage one or the other. 09:39:48

BY MR. NIMS:

Q. So do you, personally, have an opinion as to whether 09:39:52

one or the other is more difficult to change? 09:39:56

MS. WALBURN: Objection, asked and 09:39:58

answered. 09:39:58

THE WITNESS: My opinions usually are 09:40:00

based on science, and without science to say one way 09:40:02

or the other, then I am not sure that there is an 09:40:06

answer to that question. 09:40:08

BY MR. NIMS:

Q. And, therefore, you don't have an opinion? 09:40:10

MS. WALBURN: Objection, asked and answered.

THE WITNESS: Were there to be information in front of me, maybe you have some, that I could look at to talk about those two different behaviors, and maybe there is some evidence out there, but I -- I am unaware of any science that shows one answer to that question or the other.

BY MR. NIMS:

Q. When did you determine, Doctor, that you believe cigarette smoking was properly characterized as an addiction?

A. The first time I tried to stop smoking.

Q. And when was that?

A. A long time ago.

Q. Do you remember when?

A. No.

Q. Can you -- when did you start smoking?

A. I didn't start smoking until after I was in college. I played basketball, and so actually, I experimented around with some smoking back when I was a youngster, and then started playing basketball, and didn't really start smoking in earnest until after I stopped and dropped my scholarship, decided to not play basketball.

And I think that pretty quickly, within just a few months or maybe certainly within the

first year, I was really very dependent. I smoked very heavily, two to three packs a day. 09:41:26 09:41:28

And I don't really recall the first time I tried to stop but it was awful. It was one of the hardest things I had ever tried to do, and I continued to smoke for probably 10 or 12 years beyond that first attempt before I finally did stop. 09:41:32 09:41:36 09:41:36 09:41:40 09:41:44

Q. Now, you told us in your report that you stopped in 1975? 09:41:56 09:41:58

A. What page are you on? 09:41:58

Q. Page 4. 09:42:00

A. That's correct. November 22nd, 3:30 in the afternoon. I was at home alone, and I was supposed to stop that evening by 7 o'clock in order to go back to the Smokers' Clinic at 7 o'clock on Monday for the ending of our 48-hour experiment to see if we could actually stop. 09:42:08 09:42:12 09:42:14 09:42:16 09:42:20 09:42:22

Q. Clearly, it is a memorable moment in 1975 when you stopped, correct? 09:42:28 09:42:28

A. It was the hardest thing I ever did. 09:42:32

Q. Your -- you indicated that you believe you started trying to stop roughly 10 to 12 years before that? 09:42:36 09:42:40

A. I tried to stop smoking dozens of times, sometimes for as long as 10 or 15 minutes and sometimes for as long as a half a day and sometimes for as long as a day. 09:42:42 09:42:46 09:42:48 09:42:48

One time I switched to pipes and found that it really wasn't quite as good to smoke a pipe 09:42:52 09:42:56

until I learned I could inhale a pipe just like I did a cigarette, and then all the lights went off upstairs. 09:42:58 09:43:02 09:43:02

I could smoke a pipe anywhere I wanted to and no one would object to that because I used cherry blend tobacco, so it smelled good, and no one ever objected to my smoking a pipe. 09:43:04 09:43:06 09:43:10 09:43:12

So I did all kinds of things prior to ending up going to the Smokers' Clinic at Methodist. I smoked right through the rest of college, right through medical school, seeing all of the -- all the death and disability related to cigarette smoking, lung cancer, heart disease. 09:43:14 09:43:18 09:43:20 09:43:22 09:43:24 09:43:28

And I had the typical denial and rationalization that my patients have, which is that will never happen to me, so I will just continue to smoke. 09:43:32 09:43:34 09:43:36 09:43:36

I did, and finally, and probably the reason I am still here today, is I stopped smoking in 1975. That's the hardest thing I ever did, and I am glad I did. 09:43:38 09:43:42 09:43:46 09:43:46

Q. My question, Doctor, is this: You believe that you started trying to stop 10 to 12 years before that, which would be roughly 1963 to 1965? 09:43:54 09:43:58 09:44:02

MS. WALBURN: Objection, asked and answered. 09:44:04 09:44:04

THE WITNESS: I can't tell you exactly 09:44:06

when it was. And I -- it wouldn't be 1963 because I was still in -- where was I in '63? 09:44:10 09:44:14

I graduated from high school in '62 and college in '66, so it would be -- I started smoking in -- must have been my sophomore year in college. 09:44:18 09:44:20 09:44:24

BY MR. NIMS:

Q. So that would have been -- you started roughly '64? 09:44:28

A. Started roughly what? 09:44:32

Q. Smoking, started smoking roughly '64? 09:44:34

A. It would have been the spring of my sophomore year, whatever year that was. 09:44:38 09:44:38

Q. What is your best recollection of the point in time at which you attempted to quit, and at that moment determined that you believed cigarette smoking was an addiction? 09:44:42 09:44:48 09:44:52 09:44:52

MS. WALBURN: Objection, form, asked and answered. 09:44:54 09:44:54

THE WITNESS: Sometime between the time that I started and the time that I stopped. 09:44:58 09:45:00

BY MR. NIMS:

Q. So you can't put it any closer in time than between roughly 1966 and 1975? 09:45:08 09:45:14

MS. WALBURN: Objection, form, asked and answered. 09:45:16 09:45:16

THE WITNESS: It's really sometime between the time that I started and the time that I stopped. I can't be more specific than that. 09:45:16 09:45:18 09:45:28

BY MR. NIMS:

24 Q. When did you first start attempting to help other 09:45:34
25 people quit smoking? 09:45:36

1 A. I really can't recall. I guess I am not sure what 09:45:42
2 you mean by "attempting to help people to stop 09:45:46
3 smoking." 09:45:46
4 What -- you mean classmates or what do you 09:45:48
5 mean? 09:45:50
6 Q. No, I really mean in a professional capacity. I 09:45:52
7 mean clearly, at some point, as I read your CV and 09:45:56
8 your report, that's become a major part of your 09:46:02
9 life. But I am wondering when did you, as a 09:46:04
10 professional, first start as a regular part of your 09:46:10
11 medical practice trying to help people stop smoking? 09:46:14
12 A. When I was in medical school. 09:46:16
13 Q. And that was 1966 through '70? 09:46:24
14 A. Right. 09:46:24
15 Q. And that was a point in time at which you yourself 09:46:28
16 were still smoking, right? 09:46:30
17 A. I was. 09:46:30
18 Q. What was your experience in that time frame with 09:46:34
19 trying to help other people quit? 09:46:36
20 A. I am not sure exactly what you mean. "Experience" 09:46:42
21 meaning -- I would advise people to stop smoking and 09:46:46
22 try to help them to do that. 09:46:48
23 I need -- "experience" is a broad term, so 09:46:54
24 I need to have you -- I would interface with 09:47:02
25 individual patients, and if they were smokers, I 09:47:04

would advise them not to smoke and advise them to stop smoking, if that's what you mean. 09:47:06 09:47:06

Q. Did you develop any techniques that far back that you believed were the most effective ways to help people quit? 09:47:10 09:47:12 09:47:14

A. No, back then we didn't have very much taught to us in medical school about helping people to stop smoking. 09:47:20 09:47:26 09:47:26

Remember, I went to the University of Louisville Medical School, and that's right in the backyard of one of your clients, I am not sure which one, Brown & Williamson. 09:47:30 09:47:30 09:47:34 09:47:36

So the influence of the tobacco industry in that community was very pervasive, and even if it weren't, at that time in our history, there wasn't very much done as far as trying to help people to stop smoking. 09:47:36 09:47:40 09:47:44 09:47:46 09:47:50

So I don't recall any specific techniques, if you will, other than simple advice and relating their person's condition or disease to their smoking. 09:47:54 09:47:56 09:48:00 09:48:02

Q. Well, while you were at the University of Louisville Medical School were you taught in any of the courses that you attended there that smoking was statistically associated with any diseases? 09:48:06 09:48:08 09:48:12 09:48:14

A. Yes. 09:48:16
Q. So even though it was in Kentucky, that was taught at the medical school? 09:48:20 09:48:22
A. Uh-huh. 09:48:22
Q. Did you have any professor at the University of Louisville Medical School tell you during the four years you were there that he believed smoking was a good thing? 09:48:30 09:48:32 09:48:36 09:48:36
A. You know, I don't recall. There was a lot of -- a lot of classes there. I don't recall anyone doing that, but those are long days, long nights, a lot of course work. I don't recall that. 09:48:42 09:48:44 09:48:50 09:48:52
But I really may not have been paying attention to that, as a smoker, because, you know, the thing is that when you are a smoker you don't see everything, you kind of have this -- the denial and rationalization to continue to use this drug really interferes. 09:48:54 09:48:58 09:49:00 09:49:04 09:49:06 09:49:08
And so even if there had been discussion about those things, my blinders would have been up just because I was a very heavy smoker. 09:49:12 09:49:14 09:49:16
Q. Did you believe when you were smoking during the time you were at the University of Louisville Medical School that it was a bad thing and that you shouldn't be doing it? 09:49:20 09:49:22 09:49:24 09:49:26

MS. WALBURN: Objection, form. 09:49:28

THE WITNESS: I think what I just said is correct. I think that the rationalization that a person that's dependent upon a substance, what that does to the addicted person makes it difficult to interpret those sorts of things, and to then internalize that. 09:49:32 09:49:38 09:49:42 09:49:46 09:49:50 09:49:52

If you thought it was a bad thing to do and knew it was going to cause your demise, a rational being probably wouldn't do that. 09:49:54 09:49:58 09:50:02

But you are dealing with a substance that causes a severe dependence and, therefore, rationalization and denial become part of the addictive process. So I don't know that I would have felt that way because -- because of the rationalization and denial process, if that makes sense. 09:50:04 09:50:06 09:50:10 09:50:14 09:50:20 09:50:24 09:50:24

BY MR. NIMS:

Q. Do you recall whether during the four years you were there you made any attempts to quit? 09:50:26 09:50:28

A. Probably did, but I can't recall specifically. Probably when I saw a case of lung cancer or heart disease I would say, you know, it's probably not a good thing to be doing, but I can't recall a specific instance. 09:50:34 09:50:38 09:50:40 09:50:42 09:50:44

It would make sense, if you are sitting there looking at a person's lung that has cancer in it and a squamous cell carcinoma and just having had lectures about cigarette smoking causing squamous 09:50:46 09:50:50 09:50:54 09:50:58

cell carcinoma, you might expect that the thought would go through your mind, maybe I shouldn't do this, because this might happen to me. But I couldn't -- you know, that was a long time ago, I couldn't give you a specific instance. 09:51:00 09:51:04 09:51:06 09:51:06 09:51:10

Q. When you stopped yourself smoking in 1975, what was the program you went through to quit? 09:51:24 09:51:26

A. It was called the Smokers Clinics at Methodist Hospital. It was the only treatment, if you call it that, program that we had. That's what I went through was the Smokers' Clinic. 09:51:30 09:51:34 09:51:38 09:51:40

Q. Can you describe for me just in general terms how it worked and what the steps were. 09:51:44 09:51:48

A. It was a program that lasted for eight weeks, one evening a week for eight weeks, and it was two hours each session. 09:51:54 09:51:58 09:52:00

There was an hour of structured learning, usually a lecture by someone like an ENT specialist talking about laryngeal cancer and smoking or a pulmonary specialist talking about emphysema and lung cancer and such. 09:52:02 09:52:06 09:52:10 09:52:12 09:52:14

And then the other hour, the second half, would be a group intervention where there was a group facilitator that helped to lead the group through this -- the steps to try to stop smoking. 09:52:18 09:52:20 09:52:22 09:52:26

In the middle of the program -- so there was eight sessions, and then the middle of the 09:52:28 09:52:30

program was the -- what they call the 48-hour withdrawal period as an experiment to -- so that 48 hours before the next evening meeting then you were to try to stop smoking. 09:52:32 09:52:36 09:52:40 09:52:42

And then by the time you got to the meeting 48 hours later then you would be through a lot of the nicotine withdrawal symptoms. And then you would go back in the group -- you would get the group support. 09:52:44 09:52:46 09:52:48 09:52:50 09:52:50

So that's the basic framework of it. I will never forget walking into the place the first night and we were all kind of huddled around the ashtray outside the door and we were all just nervous as hell. 09:52:56 09:53:02 09:53:04 09:53:08 09:53:10

And we walked in and Bud says, "Now it looks like there is a lot of tension on your faces in the group. I want to make you relax a little bit. You don't have to stop smoking tonight." 09:53:10 09:53:14 09:53:16 09:53:18

So everybody just kind of relaxed. And so 09:53:22

it was a program with that design over eight weeks. 09:53:24

Q. Did you receive any nicotine substitution therapy of any kind? 09:53:32 09:53:32

A. It didn't exist at that time. I wish it had. It would have helped. 09:53:38 09:53:38

Q. Do you recall whether that program told you that cigarette smoking was an addiction? 09:53:50 09:53:52

A. It did that. There were -- there was a lot of discussion about that throughout, and actually, as 09:53:54 09:54:00

part of my participation in it, we began to understand that because I had had a lot more addictive -- addictions training in my fellowship. But we talked about it as an addiction, sure. 09:54:04 09:54:08 09:54:12 09:54:14

Q. Tell me a bit about what addiction training you had in your fellowship. 09:54:18 09:54:18

A. I was an internal medicine fellow for -- at the Mayo Clinic in the Mayo Graduate School of Medicine, and the first rotation I had was on psychiatry. 09:54:24 09:54:26 09:54:30

And as part of that I rotated through the addictions unit as a fellow. And then I came back to that unit as a senior fellow my fourth year of training, my third year at Mayo, my fourth year of training, and spent six months in the addictions unit, did some research. 09:54:32 09:54:36 09:54:40 09:54:44 09:54:46 09:54:48

And so that's -- at that time there was no 09:54:50

formal addictions training program, if you will. That came much later. 09:54:54 09:54:56

Q. Is it your best recollection that at the time you were going through that program which would have been between, what, 1973 and '76 -- let me give you your CV to help you put things in time. 09:55:00 09:55:02 09:55:08 09:55:14

(Defendants' Deposition Exhibit 2452 was marked for identification.) 09:55:32 09:55:40

BY MR. NIMS:

Q. I have handed you a copy of your CV, Doctor. Just for the record, can you identify that as a copy of 09:55:46 09:55:48

your CV? 09:55:48

A. Correct. 09:55:50

Q. Am I correct that it indicates you were going through your fellowship at the Mayo between 1973 and 1976? 09:55:54 09:55:58 09:55:58

A. Uh-huh, that's correct. 09:56:00

Q. Do you recall whether at that time at the Mayo Clinic they were teaching that tobacco use was properly characterized as an addiction? 09:56:02 09:56:08 09:56:10

A. Actually, at the addictions unit at that time smoking was still allowed, and so nicotine dependence was not incorporated into the treatment of other addictions. 09:56:14 09:56:16 09:56:18 09:56:18

Q. Do you know whether at that time the addiction unit 09:56:28

at the Mayo Clinic had a position one way or the other on whether tobacco use was an addiction? 09:56:30 09:56:32

A. I don't recall. The -- "position" is a term that I am not sure would be -- I could characterize very well, but I don't recall having a lot of discussion because it was a -- it was something that was continuing to be done in the unit, itself. I mean, it was not until much later that smoking was not allowed in the addictions unit. 09:56:44 09:56:48 09:56:50 09:56:52 09:56:56 09:56:58 09:57:00

Q. Do you recall, Doctor, when the first time was that you read in the 1964 Surgeon General's Report and the chapter on tobacco use and how it should be characterized? 09:57:44 09:57:50 09:57:54 09:57:56

A. No, I can't recall the first time that I read that. 09:58:00

Q. Do you know approximately, was it when you were in med school, was it after med school? Do you remember anything about when it first came to your attention? 09:58:06 09:58:10 09:58:12 09:58:12

A. I don't recall -- I remember when it happened just because of the public press. But again, when it came out I was still in undergraduate school, I remember that. But I don't recall the first time that I read it. 09:58:14 09:58:16 09:58:20 09:58:20 09:58:22

We read volumes in medical school and I don't recall when the first time I would have seen 09:58:26 09:58:28

that would have been. 09:58:28

Q. You are presently involved with the program at the Mayo Clinic for helping people quit smoking? 09:58:58 09:59:04

A. I am the director of the Mayo Nicotine Dependence Center, that's correct. 09:59:08 09:59:08

Q. Other than quitting smoking, what other dependences does that center deal with? 09:59:16 09:59:18

A. Well, you almost have to understand the evolution of this to some degree, but without going into a lot of details, we see patients who are primarily referred because of their smoking, 85 percent of our patients are referred by Mayo physicians and about 15 percent are referred by themselves. 09:59:24 09:59:26 09:59:32 09:59:34 09:59:38 09:59:40

They may have other dependencies. Alcoholism is a very common problem in people who are smokers. We do not necessarily deal with those 09:59:42 09:59:46 09:59:50

because we have an alcoholism treatment unit that deals with the alcoholism situation, if that is the case. 09:59:52 09:59:56 09:59:56

So it's a group practice that's integrated, and so we collaborate with one another as far as across those divisional and departmental lines. 10:00:00 10:00:04 10:00:06 10:00:08

So if it's a problem we try to deal with it to the best of our ability. And then if it's 10:00:10 10:00:14

something beyond our capabilities, like alcoholism that needs to be treated, we refer that on to the alcoholism treatment unit. 10:00:16 10:00:18 10:00:20

So when you say "deal with," you know, we deal with it but -- and we try to help with it, but as far as formal treatment for other dependences, not necessarily so. Sometimes maybe. 10:00:26 10:00:30 10:00:34 10:00:36

Q. So the center that you are the director of is -- really exists solely to help people quit smoking? 10:00:48 10:00:50

MS. WALBURN: Objection, asked and answered. 10:00:52 10:00:52

THE WITNESS: It really has to do more than with smoking, it has to do with nicotine dependence treatment and nicotine dependence research and nicotine research, for that matter. 10:00:54 10:00:56 10:00:58 10:01:00

So it's more than helping people to stop smoking because there are other forms of nicotine that cause dependence as well, like smokeless tobacco. We see people that are smokers of cigars, 10:01:00 10:01:02 10:01:04 10:01:08

pipes, snuff and so on. So it's not just smoking cessation, it's really nicotine dependence treatment. 10:01:12 10:01:14 10:01:16

BY MR. NIMS:

Q. So you treat people that you believe to be dependent on nicotine who are snuff users? 10:01:20 10:01:22

A. Yes, we do. Nicotine is the drug we are talking about and there are just different delivery forms of it. There is several different types of delivery forms that we deal with. 10:01:26 10:01:28 10:01:32 10:01:32

Q. And how long have you been doing this at the Mayo Clinic? 10:01:40

A. Our program opened in April of 1988 and there was probably a two-year development period before that. 10:01:44 10:01:46

Q. Have there been any changes over time in the program in terms of what you believe works best to help people quit using nicotine in any form? 10:02:04 10:02:08 10:02:12

A. Oh, sure. They -- when we started in 1988 we were kind of where the field of antibiotics was when we only had Sulpha drugs and Penicillin to treat infections. We had very crude treatments, you know, mainly nicotine gum at that time as far as pharmacologic treatment. 10:02:18 10:02:22 10:02:28 10:02:30 10:02:32 10:02:34

And so it has evolved over time and we have learned a lot more from the research that we have done as well as research other people have done. 10:02:36 10:02:40 10:02:40 10:02:42

We have a broader array of pharmacologic treatments as well as more intensive treatments, such as we have an inpatient treatment program where people are admitted to the hospital for the

treatment of their nicotine dependence, and that's the sole reason they are admitted to our treatment unit, is to get them through the withdrawal and help them stop smoking, and in some cases stop using other forms of nicotine.

Q. Does everybody that enters your program at the Mayo Clinic experience withdrawal?

A. You know, that's -- we see about 1600 new patients a year and over the years we have seen 14,000 patients, and so everybody is a lot -- there's no way to really ascertain that in a clinical program because of the breadth of the number of people that we see and the context that they are seen in as far as like they may be in the hospital with a heart attack and our counselors maybe see them for -- to help them stop smoking.

So I don't know what else to say about that.

Q. Do you know -- do you have any study or program by which you keep statistics on what percentage of the people who come through the Mayo cessation program report that they experience withdrawal?

A. We keep data on their self report of whether or not they have experienced withdrawal. I don't recall

25 that we have ever analyzed the -- I mean, again, we 10:04:22

1 are talking about thousands of patients and I don't 10:04:24
2 recall that we ever analyzed it in the way that you 10:04:28
3 are speaking of. 10:04:28
4 Q. The thousands of patients that have come through the 10:04:32
5 program since you have been there, do you keep any 10:04:36
6 statistics on what percentage of them receive 10:04:40
7 nicotine replacement therapy of any kind? 10:04:44
8 A. No, that's part of the intake interview that is done 10:04:48
9 and part of the output of the consultation and 10:04:52
10 intervention. We don't tabulate it. 10:04:56
11 Q. Do you have any estimate of the percentage of the 10:05:04
12 people who come through the Mayo Clinic smoking 10:05:06
13 cessation program who receive nicotine replacement 10:05:10
14 therapy of one form or another? 10:05:12
15 MS. WALBURN: Objection, form. 10:05:14
16 THE WITNESS: Well, you know, that's a 10:05:14
17 pretty broad question, and without -- you know, 10:05:20
18 without some specific data that -- it would be hard 10:05:24
19 to put an estimate on that, as far as a percentage 10:05:28
20 or not. 10:05:30
21 BY MR. NIMS:
22 Q. I take it it's not everyone? 10:05:32
23 A. Oh, it's -- and you have to understand that things 10:05:34
24 continue to change. We are not only talking about 10:05:36
25 nicotine replacement therapy anymore, we are talking 10:05:38

about using non-nicotine pharmacologic treatments as well. 10:05:42

So if you were to say of all the patients we see, how many get some type of pharmacologic intervention, it's a large number. 10:05:46 10:05:50 10:05:54

Q. It's less than everyone, I take it? 10:05:58

A. Could be, but I again would have to churn the numbers to really know the answer specifically. 10:06:04 10:06:06

Q. How --

A. Certainly the vast majority. 10:06:08

Q. How do you make the determination of who gets some form of nicotine replacement therapy and who doesn't? 10:06:12 10:06:16 10:06:16

A. That is determined by what experience they have had with stopping before, whether or not they have been able to stop with this particular agent or none at all, or if they have had to use combinations of different drugs to help them stop. It's really something that's worked out between me or the counselor, the patient, and sometimes the patient's referring physician. 10:06:20 10:06:22 10:06:26 10:06:30 10:06:34 10:06:36 10:06:40 10:06:44

We do an assessment of them, what they have done before, what's worked, what hasn't worked, and try to fit their individual needs. 10:06:46 10:06:48 10:06:50

Q. Other than the availability of nicotine replacement 10:07:00

forms that weren't available in 1975 when you quit smoking, are there things that your program does that are different than the program that you went through in 1975 did? 10:07:04 10:07:10 10:07:18 10:07:20

A. There is -- lots of things are different. As far as -- I mean, this is a -- as I said earlier, I think this is an evolving field, it's like all other parts of medicine. 10:07:22 10:07:24 10:07:30 10:07:30

What we did to treat rheumatoid arthritis in 1975 is very different than what we do today and the understanding of it is very different than what we understand today. So the basic hallmarks or the principles have evolved and -- but a lot of it was there in '75 but we continue to learn. 10:07:36 10:07:38 10:07:40 10:07:44 10:07:50 10:07:52

That's what science is all about, you do experiments and you find out what may work better and then you try to incorporate those into your clinical practice. 10:07:54 10:07:56 10:07:58 10:07:58

Q. As best you can, tell me what your program at the Mayo Clinic today does that you don't believe was done in 1975 in the program that you went through. 10:08:02 10:08:08 10:08:10

A. Oh, I think that's too broad. I mean, you would have to give me a more specific question. This is a large program. We see lots of patients, and so the development of it over time has evolved. 10:08:14 10:08:18 10:08:24 10:08:28

I -- there's a lot of -- we have nicotine gum, we have nicotine nasal spray, we have nicotine 10:08:30 10:08:34

patches, we have -- soon to have a nicotine inhaler, we have Bupropion, which is a non-nicotine pharmacologic agent, we have Clonidine. 10:08:38 10:08:40 10:08:44

None of those things were present as far as being used for the treatment of nicotine addiction back in 1975, and that's just -- -- that's just some of the different -- those are very specific and easily stated differences. The pharmacotherapy has expanded a lot. 10:08:44 10:08:46 10:08:50 10:08:54 10:08:58 10:09:02

Q. Do you believe that your program in 1997 is more successful in helping people quit than the program you went through at Rochester Methodist Hospital in 1975 was? 10:09:10 10:09:14 10:09:18 10:09:20

A. I think it is the state-of-the-art as far as the treatment of people with nicotine dependence as far as what we have currently in 1997, and depending upon the severity of the addiction of the individual patient, would determine whether or not we are more successful or not. 10:09:22 10:09:26 10:09:30 10:09:34 10:09:36 10:09:36

We have never gone back to make any real comparisons of that because it would be comparing apples and oranges. The patients have changed, as the easy ones have stopped smoking before, we see 10:09:38 10:09:42 10:09:44 10:09:48

people with the whole spectrum of nicotine addiction, very mild to very severe. 10:09:52 10:09:56

We didn't have that same perspective back in 1975 because we didn't -- we were just beginning to understand it very well. 10:09:58 10:10:00 10:10:02

Q. The people you see today at the Mayo Clinic who enter your program, is stopping smoking their only problem or do they have other problems that complicate the process of getting them off the use of cigarettes? 10:10:08 10:10:14 10:10:16 10:10:22 10:10:22

MS. WALBURN: Objection, form. 10:10:24

THE WITNESS: You know, that's a hard question to answer. Maybe you can repeat it for me. 10:10:28 10:10:34 10:10:34

BY MR. NIMS:

Q. Well, I am -- I am thinking -- 10:10:38

A. What's the point? 10:10:38

Q. I read an article a couple of weeks ago in the New York Times that quoted you and talked about your program, and as I understood the take of the article, it suggested that the people coming into the Mayo Clinic smoking cessation program brought a lot of baggage with them these days, that these were the hardest people to help because smoking wasn't their only problem, they had co-morbidities, they 10:10:44 10:10:44 10:10:50 10:10:52 10:10:56 10:11:00 10:11:02 10:11:06

had other psychological problems, all of which were very relevant to helping them quit smoking. 10:11:10 10:11:16

Was that a fair characterization of the article? 10:11:18 10:11:18

MS. WALBURN: Objection, form. 10:11:20

THE WITNESS: Yeah, I guess I would have to see what the article looks -- I saw it but I 10:11:22 10:11:24

didn't reread the whole article, so if you have got it I could probably pinpoint that better. 10:11:26 10:11:28

BY MR. NIMS:

Q. You don't remember without seeing it, the article in the New York Times about your program? 10:11:30 10:11:32

MS. WALBURN: Objection, form, asked and answered. 10:11:34 10:11:34

THE WITNESS: Yeah, I saw the article but, you know, I see a lot of paper every day and sometimes I read things for detail, sometimes I don't, so I couldn't answer that really without knowing some of the specifics that you are talking about, what was said in the article. 10:11:38 10:11:40 10:11:42 10:11:46 10:11:48 10:11:50

BY MR. NIMS:

Q. Does a high percentage of the patients who come through your smoking cessation center at the Mayo Clinic have other problems, psychologically, which contribute to the difficulty they face in quitting smoking? 10:11:52 10:12:00 10:12:04 10:12:06 10:12:06

MS. WALBURN: Objection, form. 10:12:08

THE WITNESS: That's a lot of questions in one question. Let me see if I can explain it to you. 10:12:10 10:12:14 10:12:14

We see the spectrum of people with nicotine addiction, all the way from mild to severe. And I in my own personal medical practice, which is the other half of my life, I see patients on a daily basis from the community in Olmsted 10:12:16 10:12:18 10:12:24 10:12:26 10:12:32

County. I am a primary care physician, so I see patients that come from that, as well. 10:12:36 10:12:40

So I don't tally up who has what in that practice any more than I tally it up in the other part of the practice. 10:12:42 10:12:46 10:12:46

BY MR. NIMS:

Q. So you don't know whether a large percentage of the patients who come through the Mayo Clinic have other psychological problems that contribute to the difficulty they face in quitting smoking? 10:13:00 10:13:02 10:13:02 10:13:04

MS. WALBURN: Objection, form, asked and answered. 10:13:06 10:13:06

MR. NIMS: No, asked again but answered is hard. 10:13:08 10:13:08

MS. WALBURN: Objection to counsel's colloquy. 10:13:10 10:13:12

THE WITNESS: Counsel, that's a hard question to answer. I mean, you have got too many parts to the question. So if you can give me some more specifics and not have too many parts to it maybe I can answer it. 10:13:12 10:13:14 10:13:16 10:13:18 10:13:18

BY MR. NIMS:

Q. I can't get below the one part that's in it. Do they or do they not, in your opinion, have other psychological problems that contribute to their difficulty in quitting smoking? That doesn't have multiple parts, it has one. 10:13:22 10:13:24 10:13:26 10:13:28 10:13:32

MS. WALBURN: Objection to the form and counsel continuing to ask argumentative questions with long speaking predicates. 10:13:34 10:13:38 10:13:42

MR. NIMS: Yeah, I am a real arguer, all right. 10:13:46 10:13:46

THE WITNESS: We treat the spectrum of patients that have mild to moderate to severe dependence. They have the whole -- 10:13:48 10:13:52 10:13:56

BY MR. NIMS:

Q. Doctor, I asked other psychological problems. Can you answer that, or not? 10:14:00 10:14:00

MS. WALBURN: Excuse me, counsel. I would appreciate it if you are not -- would have the courtesy of not interrupting the witness while he is trying to answer your questions. 10:14:02 10:14:04 10:14:08 10:14:10

MR. NIMS: I assure you, I will not interrupt if he tries to answer my question. 10:14:12 10:14:16

THE WITNESS: We treat the patients that come to us regardless of what they have, as far as medical problems. Our primary goal is to try to help them to stop smoking, and we treat the spectrum of patients all the way from my primary care practice to the -- kind of the tertiary practice, if you will, with more intensive services. 10:14:18 10:14:22 10:14:26 10:14:30 10:14:32 10:14:36 10:14:38

And patients will have other diseases and other conditions that are tobacco-related because that's what this causes. I mean, if you smoke cigarettes you are going to develop lung cancer, 10:14:44 10:14:46 10:14:50 10:14:52

heart disease, emphysema, arteriosclerosis of the legs and so on. And so there will be people with those sorts of things, sure. 10:14:56 10:14:58 10:14:58

BY MR. NIMS:

Q. Those are psychological difficulties? 10:15:02

A. Ah --

MS. WALBURN: Objection, there is no question pending. 10:15:04 10:15:06

BY MR. NIMS:

Q. Let me ask you this, Doctor. When a person enters 10:15:08

the program, other than asking them whether they smoke and getting the answer, "Yes, I do," what else do you give them by way of tests when they enter the program to provide information that will help tailor a program to help them stop? 10:15:12 10:15:16 10:15:20 10:15:24 10:15:28

A. Well, it depends on the patient. We have a standard questionnaire that we give to all patients that they complete, which includes things like the Fagerstrom Tolerance Questionnaire as well as other questions about their previous attempts to stop and so on. 10:15:32 10:15:36 10:15:40 10:15:42 10:15:46

And that is used then to discuss with the patients a treatment plan. So that's kind of the general information gathering, if I have got your question correctly. That's what we do -- every patient gets one of those. 10:15:50 10:15:52 10:15:56 10:15:58 10:16:00

Q. Do you give them any kind of personality test or psychological test? 10:16:02 10:16:04

A. It depends. It depends on the patients and what the needs are. But as a rule, what we do for them is what I just described, which is a questionnaire that contains a lot of questions about nicotine dependence and the Fagerstrom Tolerance Questionnaires is in there. 10:16:08 10:16:12 10:16:14 10:16:16 10:16:18 10:16:22

If their physician -- and again, 85 percent of these people are referred by their 10:16:22 10:16:24

physician -- if they want to do other things that have to do with their smoking, you know, psychological or otherwise, they may do that, but that's not -- that's not something we do on every person, but we do the whole -- I mean, there is a lot of things we do. 10:16:26 10:16:30 10:16:32 10:16:36 10:16:40 10:16:40

Q. Do you measure in any way their level of anxiety or depression? 10:16:46 10:16:48

A. Measure in what way? 10:16:50

Q. Any way. 10:16:52

A. We do a clinical assessment of that. 10:16:56

Q. Do you give them a Minnesota Multiple Personality test? 10:17:04 10:17:04

A. The MMPI is given to some but it's not done routinely, if you will. 10:17:10 10:17:12

Q. For those that it's given, why is it given? 10:17:16

A. It would be up to the physician that would be taking care of the patient. Again, these are mainly physician-referred patients and that would not be something that we would routinely do. 10:17:18 10:17:20 10:17:22 10:17:26

Q. You don't believe that it would tell you anything about a person's personality that might be relevant to why they are having trouble quitting smoking? 10:17:28 10:17:32 10:17:34

A. Oh, it might tell us some things, but, you know, we only have a certain amount of time to deal with the 10:17:40 10:17:42

patients and the thing that we really focus on is their nicotine addiction and dealing with that because that is the central feature of all these patients. 10:17:46 10:17:48 10:17:52 10:17:52

They are dependent upon nicotine. It's a drug that's been part of their lives for sometimes several decades, and the focus of our energy is on helping them to stop that, not doing all kinds of other assessments that may be peripheral to that. That is the issue, it's nicotine addiction, nicotine dependence, it's not some of these other things. 10:17:54 10:17:58 10:18:00 10:18:04 10:18:08 10:18:10 10:18:14

Q. Does everybody who comes through your program smoke at least two packs a day? 10:18:20 10:18:22

A. It depends on which program you are talking about. 10:18:26

Q. The Mayo Clinic smoking cessation program. 10:18:28

A. It's the nicotine dependence program at the Mayo Clinic. We stopped calling it smoking cessation back several years ago. 10:18:34 10:18:36 10:18:36

But it's the nicotine dependence program, and we have people who don't smoke at all, some use smokeless tobacco, some use pipes, cigars. And within the program there are different levels of 10:18:38 10:18:42 10:18:46 10:18:48

23 treatment for the different levels of dependence. 10:18:50
24 So I don't know which target -- 10:18:54
25 Q. Are there people who -- excuse me. I didn't mean to 10:18:56

1 interrupt. 10:18:56
2 A. Well, I mean, there are different levels of 10:18:58
3 treatment for different levels of dependence, as far 10:19:02
4 as we can provide that. 10:19:04
5 And so there is no answer to your question 10:19:06
6 because two packs a day, a lot of people smoke two 10:19:10
7 packs a day, some people smoke a lot less than that 10:19:12
8 and some people don't smoke at all, they use other 10:19:16
9 forms of nicotine. 10:19:16
10 Q. So there are people who come through your program 10:19:18
11 who smoke less than two packs a day who are smokers? 10:19:20
12 A. That's correct. 10:19:22
13 Q. Are there people who come through your program who 10:19:26
14 smoke low-tar, low-nicotine cigarettes and are still 10:19:30
15 in your program? 10:19:30
16 A. That's correct. Some people smoke five packs a 10:19:34
17 day. Hard to get them all in in one day, that's a 10:19:36
18 lot of smoking to do for -- 100 cigarettes in a day 10:19:40
19 is pretty tough to do. So we have the full range of 10:19:42
20 people smoking smaller amounts, every size, shape 10:19:46
21 and form of cigarette that's ever been used has 10:19:48
22 probably been represented in our program. 10:19:50
23 Q. Have you found that it's always harder to help a 10:19:54
24 two-pack-a-day smoker than a one-pack-a-day smoker 10:19:56
25 or does it vary? 10:19:58

A. Always and never are things that I just probably never would use, except in that context, because that's just too much. Never is a long time and always is more than I can fathom. So it varies from individual to individual, from groups to groups, and -- 10:20:02 10:20:06 10:20:08 10:20:14 10:20:18 10:20:18

Q. Is it fair to say that your own experience has been there are people who smoke one pack for whom quitting turns out to be more difficult than it is for people who smoke more than that? 10:20:22 10:20:26 10:20:28 10:20:30

A. I would say that there are some people that smoke five cigarettes a day. It's harder for them to do that than people who smoke more than that. So it's a range of things. It depends on where they are in the addictive process and how difficult this is for them to do and how much they can extract from the cigarettes. 10:20:32 10:20:36 10:20:38 10:20:40 10:20:44 10:20:46 10:20:46

Q. Do you believe that it also depends on the personality of those people? 10:20:48 10:20:50

A. Personality in what context? Personality is a very broad term. That's almost like never and always. Personality is a -- can you be more specific? 10:20:54 10:20:58 10:21:02

Q. No, I don't want to suggest one facet of personality over another, I just want to know -- you know, you see thousands of patients, you have told me, that 10:21:08 10:21:10 10:21:14

come through who want help quitting smoking. 10:21:16

Are there any personality factors that you 10:21:18

have found are important in how hard or how non-hard 10:21:24

it will turn out to be for them? 10:21:26

MS. WALBURN: Objection, form, asked and 10:21:28

answered. 10:21:28

THE WITNESS: Again, it real -- the key 10:21:32

point in all this is the nicotine dependence. 10:21:36

BY MR. NIMS: 10:21:36

Q. The personality doesn't matter -- 10:21:38

MS. WALBURN: Excuse me. Excuse me, 10:21:40

counsel.

THE WITNESS: Nicotine addiction is the 10:21:40

drug we are talking about. And when you have a drug 10:21:44

involved in a dependence-producing process, then it 10:21:48

basically takes over up here to the exclusion of 10:21:54

even rational thought because denial and 10:21:56

rationalization hook into that. 10:22:00

So it really alters all of those other 10:22:04

things that I think you are trying to get at as far 10:22:08

as personality. It makes it difficult for those 10:22:10

things to even come into play because the central 10:22:12

issue is the drug. In this case, the drug is 10:22:14

nicotine. 10:22:16

BY MR. NIMS:

Q. So if I understand what you are telling me, a person 10:22:20

who is, quote, on nicotine, that has become so important that personality no longer matters as far as you are concerned? 10:22:26 10:22:30 10:22:30

MS. WALBURN: Objection, form. 10:22:32

THE WITNESS: It becomes so important to that individual patient that that person would ignore waking up in an intensive care unit with burn marks on their chest from the paddles to put their heart back into rhythm after having had a heart attack, they would -- some of these patients would -- the first thought that would go through their mind was, "I need a cigarette." And then they would leave the coronary care unit to go have one. 10:22:34 10:22:38 10:22:42 10:22:46 10:22:48 10:22:52 10:22:54 10:22:58 10:23:00

So in the context of that alters their behavior, it's a -- it is the central factor. I mean, I don't know what -- what else to say. 10:23:04 10:23:06 10:23:10

BY MR. NIMS:

Q. Tell me, Doctor, how is it you believe that you were able in 1975 -- without the sophisticated techniques that you now say you employ, how were you personally able to beat this nicotine addiction? 10:23:12 10:23:20 10:23:24 10:23:28

A. The real answer to that is I haven't beaten it. If I were to have a cigarette today, I would be back to smoking two packs a day within a week. 10:23:32 10:23:34 10:23:38

This is something that we talk about as in terms of recovering but not recovered. It never goes into the past tense. I'm just like a lot of 10:23:40 10:23:44 10:23:50

the patients that I have seen, it was very, very difficult and I worked very hard at it. 10:23:52 10:23:56

But I do not consider myself recovered from nicotine addiction. I am in the process of recovering. It never stops. 10:23:58 10:24:02 10:24:04

Q. Well, you have gone, what, 22 years without trying that additional cigarette. How is it you think you have been able to do that? 10:24:12 10:24:14 10:24:16

A. Oh, a lot of different -- you know, after the first few months it became easier to avoid the first cigarette. 10:24:22 10:24:24 10:24:24

So actually, avoiding the first cigarette is kind of one of the key factors that I had to do in order to -- because I had done that a hundred times before where I would say, "Well, maybe I will just have one." And then after being off of cigarettes for a few days I would have one and I would be right back to smoking two packs a day within a few days. 10:24:26 10:24:30 10:24:32 10:24:34 10:24:36 10:24:40 10:24:42 10:24:44

So part of that has been just the realization that I can't just have one. It's like people who are alcoholic. And that's the common 10:24:46 10:24:48 10:24:52

teaching in addictions units, is that an alcoholic is only one drink away from another binge. It's the same. 10:24:56 10:25:00 10:25:00

MR. NIMS: Why don't we take a ten-minute break. 10:25:08 10:25:08

VIDEOGRAPHER: We are temporarily going 10:25:10

off the video record. The time is now 10:25 a.m. 10:25:14

(A recess was taken.)

VIDEOGRAPHER: We are back on the video 10:40:06
record. The time is now 10:40 a.m. 10:40:16

BY MR. NIMS:

Q. Doctor, is your opinion that nicotine is properly 10:40:18
characterized as addictive dependent upon 10:40:22
pharmacology of nicotine? 10:40:22

A. That's part of it. 10:40:26

Q. How much a part of it? 10:40:28

A. The way nicotine works in the body as a drug, it 10:40:38
works in the central nervous system, it affects 10:40:40
other parts of the body, as well, so it's a 10:40:42
substantial part. 10:40:42

Q. What's important about the pharmacology of nicotine 10:40:48
that makes it addictive, in your opinion? 10:40:52

MS. WALBURN: Objection, form. 10:40:54

THE WITNESS: You know, they have such 10:40:56
wide ranging effects. Maybe you could be more 10:41:00

specific about what you are talking about. Are you 10:41:02
talking about -- which effect are you talking 10:41:04
about? 10:41:04

BY MR. NIMS:

Q. Any effect. 10:41:06

A. Pharmacology is a -- 10:41:08

Q. If pharmacology is important to why you believe 10:41:10
nicotine is addictive, I just want to know what 10:41:14

facets of pharmacology do you believe are important? 10:41:16
A. That's -- I need to be more specific. Pharmacology 10:41:22
is a whole field, for starts, and the 10:41:24
pharmacology -- the pharmacologic actions of 10:41:26
nicotine are many. So I mean, I need to have you 10:41:30
give me some -- I need to have a better handle on 10:41:34
what you are asking. 10:41:36
Q. I am asking for any facet of pharmacology that you 10:41:40
believe is important to what you believe to be the 10:41:44
addictiveness of nicotine. 10:41:46
A. The effect that nicotine has on the central nervous 10:41:50
system is probably one of those things, if that's 10:41:56
what -- if that's what you mean. What it does to 10:42:00
the brain. 10:42:00
Q. What does it do to the brain? 10:42:02
A. Lots of things. It does a lot of things to 10:42:06
different parts of the brain. It affects the brain 10:42:10

in many different ways. 10:42:10
Q. Give me the four most important. 10:42:14
MS. WALBURN: Objection, form. 10:42:16
THE WITNESS: The effect of this drug is 10:42:18
so broad and so -- there is so many parts to it, 10:42:22
that there is not an answer to your question. 10:42:26
It affects the receptors in the brain, the 10:42:32
nicotinic receptors which used to be -- as I have 10:42:34
said in my report, these are called acetylcholine 10:42:40
receptors in their native state and they can be 10:42:42
affected by nicotine, and that's one of the effects 10:42:46

that nicotine has on the brain substance. 10:42:50

BY MR. NIMS:

Q. Are all drugs that you believe to be addictive -- 10:42:56

strike that. 10:42:56

Do all drugs that you believe to be 10:42:58

addictive affect the acetylcholine receptors? 10:43:04

A. Drugs that are addictive affect receptors in the 10:43:08

brain. Not necessarily all drugs affect all 10:43:14

different receptors and different drugs affect 10:43:18

different receptors differently. 10:43:20

Q. Is that important? 10:43:20

MS. WALBURN: Objection, form. 10:43:24

THE WITNESS: Is what important? 10:43:26

BY MR. NIMS:

Q. How they affect receptors differently. 10:43:28

A. The fact that they affect receptors is the important 10:43:30

part and that's -- and if the receptors happen to be 10:43:34

in the pathway that has to do with, in this 10:43:38

instance, Dopamine and other things like that, 10:43:40

that's an important feature, yeah. 10:43:42

Q. How many drugs that you regard to be addictive 10:43:44

affect the acetylcholine receptors? 10:43:48

A. The one we are talking about is the main one, and 10:43:50

that's nicotine. And it affects them because it 10:43:52

actually has gotten the label of being the nicotinic 10:43:54

receptor. And it really wasn't a nicotinic receptor 10:43:58

to begin with, it was an acetylcholine receptor. 10:44:02

And it can accommodate nicotine and it opens its channel because of nicotine or acetylcholine. So nicotine, the drug, affects those receptors. 10:44:04 10:44:06 10:44:12 10:44:14

Q. Right. I understand that. You have told me that and that's clearly on the record. 10:44:16 10:44:18

How many drugs that you regard to be addictive affect the acetylcholine receptors? 10:44:22 10:44:26

A. Well, you know, you have to look at -- you have to look at all of the different drugs that have addictive properties, and the acetylcholine receptor is the central one for nicotine. And I am not sure 10:44:32 10:44:34 10:44:40 10:44:44

what the other drugs we are talking about have to do with that. I am not -- not sure why. 10:44:46 10:44:50

Q. Can you name me any other drug that you regard to be addictive that you believe works in the brain through the acetylcholine receptor? 10:44:58 10:45:00 10:45:02

A. The output of the other drugs like opiates and cocaine, for example, have outputs of Dopamine. Whether or not that's mediated through the nicotinic receptor, could be, but I guess not -- I haven't really studied that in that depth as far as those effects. I am really focusing on the primary drug we are talking about, which is nicotine. 10:45:06 10:45:10 10:45:12 10:45:16 10:45:20 10:45:24 10:45:26

Q. Well, I guess what I am trying to find out is how important do you believe it is that it affects the acetylcholine receptor? Is that fundamental to why it's addictive, in your opinion? 10:45:30 10:45:32 10:45:38 10:45:38

MS. WALBURN: Objection, asked and answered, form. 10:45:42

THE WITNESS: The way that nicotine affects the acetylcholine receptor is a very important part of the addictive process. 10:45:44 10:45:48 10:45:50

BY MR. NIMS:

Q. And why do you believe that to be true? 10:45:52

A. Because it causes the release of other neurotransmitters, and in this case it causes the release of Dopamine. 10:45:56 10:45:58

Q. Are there any other reasons you believe that to be true? 10:46:00 10:46:04

MS. WALBURN: Objection, form. 10:46:06

THE WITNESS: Any other reasons that -- can you repeat the original question about what -- 10:46:06 10:46:10 10:46:14

BY MR. NIMS:

Q. Are there any other reasons that you believe that the impact that nicotine has on the acetylcholine receptor is fundamental to why it's an addiction? 10:46:16 10:46:24 10:46:26

MS. WALBURN: Objection, form. 10:46:30

THE WITNESS: The nicotine affects the acetylcholine receptor and causes it to release neurotransmitters, one of which is Dopamine, and that Dopamine is important in the addictive process. 10:46:30 10:46:32 10:46:36 10:46:40 10:46:42

BY MR. NIMS:

Q. Does nicotine cause more Dopamine to be released 10:46:46

than other substances cause Dopamine to be released? 10:46:50

A. It probably depends upon the dose that's used and the method of administration, so it depends on a lot of different -- different other factors, probably. 10:46:56 10:47:00 10:47:02

Q. If you smoke a pack of cigarettes over a day and you do a line of cocaine, which causes more Dopamine to be released? 10:47:14 10:47:20

A. It would probably depend upon how hard the cigarettes are smoked, how hard they are smoked and also how long the line of cocaine is. I mean, I don't -- so it really depends upon the dose, the way of administration, and particularly in cigarettes, it's the way that they are smoked determines how high the levels are in the brain. 10:47:20 10:47:24 10:47:30 10:47:34 10:47:36 10:47:40 10:47:42 10:47:44

If you inhale more deeply, hold your breath longer, then you can get more nicotine in than you can if you just casually puff on a cigarette. So it really depends on the dose, how it's administered for both of those substances. 10:47:48 10:47:50 10:47:54 10:47:56 10:48:00

Q. Have you done any research, yourself, on the action of receptors under the influence of any drug, nicotine or any other drug? 10:48:06 10:48:12 10:48:12

A. Have I done research on receptors? 10:48:16

Q. Yes. 10:48:16

A. No, I have not. But I haven't done research on a lot of things having to do with this, so it's -- receptors are only one part of it. 10:48:22 10:48:24 10:48:26

We have done research on how drugs affect these receptors as far as the outcome, which is the thing that I do the most, which is to help people stop smoking. We have done work with drugs to

influence Dopamine in the way that -- to help people stop smoking, we have done work like that.

Q. Do you believe that the addictiveness of a drug is tied to the amount of Dopamine that it causes to be released in the brain?

A. I think Dopamine is a central factor and it's only been recently that we in the scientific world have begun to understand the importance of Dopamine. I think it's one of the factors. There may be others because nicotine causes other neurotransmitters to be released as well.

But Dopamine seems to be a common one that's released when it comes to cocaine, opiates and nicotine, and there is published literature in the peer-reviewed public domain that has to do with those substances and how they affect Dopamine and --

Q. My question, Doctor, is not whether you regard Dopamine to be important, you have clearly told me that you do.

My question is, is the amount of Dopamine released a measure of the addictiveness of a drug, in your opinion?

MS. WALBURN: Objection, form, asked and

answered. 10:49:52

MR. NIMS: No, it's been asked. 10:49:56

THE WITNESS: Well, it's relative to the dose of the drug we are talking about. I mean, it's not a simple -- it's not as simple as that. I mean, it really isn't. 10:49:58 10:50:00 10:50:06 10:50:06

When you look at what happens to the levels of nicotine, say just in the central nervous system, when a person smokes a cigarette one way versus another, the levels can be very, very different and so -- I mean, I think it depends on the dose and it depends on the method of administration. 10:50:08 10:50:12 10:50:16 10:50:18 10:50:24 10:50:26 10:50:26

BY MR. NIMS:

Q. Doctor, I don't mean to interrupt. 10:50:28

MS. WALBURN: Well, you do. 10:50:30

BY MR. NIMS:

Q. If you will listen to my question I think we will move along more expeditiously. 10:50:32 10:50:34

I didn't talk about the level of smoking and how that might affect Dopamine, I asked a very precise question. 10:50:38 10:50:44 10:50:44

Do you believe the level -- the addictiveness of a drug is dependent upon the amount of Dopamine released when the drug is used? 10:50:46 10:50:52 10:50:54

MS. WALBURN: Objection to counsel continuing to interrupt the witness, objection to 10:50:56 10:50:58

form and asked and answered.

THE WITNESS: The levels of Dopamine that are released are dependent upon the levels of the substance that reach the central nervous system.

It's not -- it's not simple to just quantify this in a way that you want. I mean, it's not as simple as that.

It's dependent upon the dose, the route of administration. For example, if you put a nicotine patch on the skin, the levels of nicotine that reach the brain are relatively low compared to what you do when you smoke a cigarette. And so those factors have to do with the release of this, and they have to do with the addictive potential of a drug. The delivery, the speed of delivery, are central to the addictiveness of a drug.

BY MR. NIMS:

Q. How fast do amphetamines reach the brain?

MS. WALBURN: Objection, form.

THE WITNESS: Amphetamines reach the brain as fast as the delivery system that's used allow them to do that. I mean, that's -- the delivery form is very important when it comes to the speed with which they reach the brain.

And inhaled substances, particularly

inhaled volatile substances like free-base nicotine, reach the circulation very rapidly and reach the brain very rapidly, much like free-base cocaine does. If you inhale free-base cocaine it reaches the brain faster than it does if you snort it. So the route of administration of amphetamines would have to do with how fast it reaches the brain. 10:52:18 10:52:22 10:52:26 10:52:30 10:52:34 10:52:36 10:52:38

BY MR. NIMS:

Q. And once amphetamines get there do they release Dopamine? 10:52:40 10:52:42

A. I would have to go back and look. I can't recall. 10:52:44

Q. Do they act on receptors? 10:52:48

A. Oh, yeah, they act on receptors. 10:52:50

Q. Do they act on the acetylcholine receptor, do you know? 10:52:54

A. I don't recall. I would have to go back and look. 10:53:00

Q. Do you regard amphetamines as addictive? 10:53:06

A. Amphetamines are an addictive substance. 10:53:10

Q. Do people come to the Mayo Clinic, not your unit, but to the Mayo Clinic for assistance in dealing with an amphetamine addiction? 10:53:12 10:53:16 10:53:18

A. People come to the Mayo Clinic with all kinds of things. I am sure they must. 10:53:22 10:53:22

Q. Have you had any experience helping people get off an amphetamine addiction? 10:53:26 10:53:28

A. Well, the experience would be back probably when I was in training and when I was more an intimate part 10:53:32 10:53:34

of the addictions unit, the alcoholism treatment unit. But it's been -- been a long time ago. 10:53:38 10:53:40

Most of my recent past, as you have pointed out, has been focused on nicotine addiction. It's -- and it's -- quite frankly, it's a bigger problem than speed and amphetamines are, both in terms of use and death and disability and so on. So it's -- it occupies almost all of my time now. 10:53:44 10:53:46 10:53:50 10:53:54 10:53:58 10:54:00 10:54:00

Q. Do you believe that getting people off smoking is a bigger problem than getting them off alcohol? 10:54:08 10:54:10

A. Both substances are very dependence producing, both of them are very difficult to stop, and it depends on the individual patient, as well as the whole broad spectrum of people with alcoholism having difficulty stopping smoking and vice versa. So it really is dependent upon the severity of those dependences within that person, if you are talking about an individual. 10:54:16 10:54:20 10:54:24 10:54:28 10:54:32 10:54:36 10:54:40 10:54:42

As a rule, and like I said in my report, people who are recovering alcoholics and recovering from other drug dependencies say that it was harder for them to stop smoking than it was for them to 10:54:44 10:54:46 10:54:50 10:54:54

stop drinking. That's what the literature, the scientific peer-reviewed literature, would say. 10:54:56 10:54:58

Q. Are there people for whom it's easier to quit smoking than it is to quit -- excuse me, than it is 10:55:04 10:55:08

to quit other addictions? 10:55:08

A. Say that again. 10:55:12

Q. Are there people for whom it is easier to quit smoking than it is to quit other addictions? 10:55:16 10:55:20

A. Oh, "easier" is a relative term. It's hard any way you go about it, and so there may be some that would be -- need less treatment to do one than another. But it's like treating high blood pressure, some people need to have more medicine than other people do. There may be some differences. 10:55:28 10:55:30 10:55:34 10:55:36 10:55:38 10:55:40

Q. It's reported, is it not, Doctor, that roughly 50 million Americans have quit smoking since the 1964 Surgeon General's Report? 10:55:46 10:55:50 10:55:50

A. That's what's been reported but the number is actually probably higher than that because I don't think they account for the people that died of smoking-related diseases in those numbers, and that's now over 400,000 people a year in our country alone and two million worldwide. 10:55:58 10:56:00 10:56:02 10:56:06 10:56:08 10:56:10

Q. Doctor, that wasn't my question and you know it. 10:56:12

MS. WALBURN: Well, excuse me. 10:56:14

BY MR. NIMS:

Q. If you could answer my question. My question didn't have anything to do with 400,000. It was simply, it has been reported, has it not, that 50 million Americans have quit smoking? 10:56:24 10:56:26 10:56:28 10:56:28

MS. WALBURN: Well, I am going to object to your continuing to interrupt Dr. Hurt. 10:56:32 10:56:34

MR. NIMS: Well -- 10:56:34

MS. WALBURN: Excuse me, and I am going to object to your interrupting myself as well. 10:56:36 10:56:38

I am going to object to your interrupting Dr. Hurt's testimony. He was answering your question directly. You didn't like the answer. 10:56:40 10:56:42 10:56:44

MR. NIMS: Yeah, right. 10:56:44

MS. WALBURN: He has a right to complete his answer. 10:56:46 10:56:46

MR. NIMS: Yeah, you go tell the judge that his answer was responsive to my question and let's see what ruling we get. 10:56:48 10:56:50 10:56:52

BY MR. NIMS:

Q. Now, Doctor, if we could go back to my question. 10:56:54

Do you agree that it has been reported that 50 million Americans have quit smoking since the issuance of the 1964 Surgeon General's Report? 10:56:54 10:56:56 10:57:00

MS. WALBURN: Objection, asked and 10:57:02

answered. 10:57:02

THE WITNESS: I answered basically the same way. When we count people who stop a behavior, whatever it is, if they happen to die, then they stop smoking. And I think that would be an obvious conclusion that anyone would reach. 10:57:06 10:57:08 10:57:10 10:57:12 10:57:14

So what I said was correct, that the estimates of 50 million people stopping smoking did not account for those that died of tobacco-related 10:57:16 10:57:20 10:57:22

diseases, which is many millions more. 10:57:24

So those people stopped smoking, too, they 10:57:28

just happened to die from it. 10:57:30

BY MR. NIMS:

Q. And I asked about that and you pointed it out for me 10:57:32

and I appreciate that. 10:57:34

Let me ask you this, Doctor. Of the 50 10:57:38

million who stopped, not because they died but 10:57:42

because they stopped, the ones I asked about, is it 10:57:46

also reported that 95 percent of them did so without 10:57:52

help? 10:57:52

MS. WALBURN: I am going to object to the 10:57:54

form of the question and counsel's remarks that are 10:57:56

interspersed within attempting to phrase a 10:58:00

question. 10:58:00

THE WITNESS: Maybe I should just have you 10:58:04

read it back or maybe you can tell me what it was. 10:58:06

I kind of lost track of the question. 10:58:08

BY MR. NIMS:

Q. Is it also reported that of those 50 million people 10:58:10

who quit smoking, 90 to 95 percent did so without 10:58:14

help? 10:58:14

A. Without help? Well, I am not sure exactly what you 10:58:20

mean by that. But the fact -- 10:58:24

Q. I mean is that reported? 10:58:24

A. The facts are that the people who stopped smoking 10:58:28

that are, quote, self-quitters, if you will, quit 10:58:34

because of all kinds of different reasons and 10:58:38

influences. When you look at those people that report stopping on their own, they may have had a heart attack or they may have had lung disease, they may have had a wife or spouse that was concerned about their smoking. Their doctor usually -- 65 plus percent of people who are seeing a doctor will get advice to stop smoking, and smokers see their doctor almost every year because they have increased rates of illnesses. So stopping on your own is kind of a euphemism because there are too many other

influences that go into the equation. If you have a -- if you end up having a heart attack and stop smoking because of that, then you might call that stopping on your own but the influence of having had a heart attack is a pretty good-sized deal. I mean, it helps.

Q. We are not yet talking about what their motivation may have been, Doctor. My question is, do you agree that it is reported that 90 to 95 percent of those 50 million people who quit did so without professional assistance, whatever may have contributed to their motivation?

A. Well, if you have something that you can refer me to as far as the report you are talking about, maybe we

can look at it because sometimes the headlines in the newspapers don't always reflect what's in the absolute scientific report. So if you have got a report that has to do with that, I would be more than happy to try to sort that out. 10:59:48 10:59:50 10:59:52 10:59:56 10:59:58

I have given you the best answer I can as far as why people stop smoking. And self-quitters are a category that is often mischaracterized for the reasons I have outlined. 11:00:00 11:00:02 11:00:06 11:00:08

So maybe if you have something that you want to show me that we can look at. If you do, 11:00:08 11:00:12

let's look at it. 11:00:12

Q. Doctor, your experience at the Mayo Clinic, I take it, is with people who are entering a program for assistance in help, for assistance in quitting; that's correct, is it not? 11:00:16 11:00:18 11:00:24 11:00:24

A. Not necessarily. Some people are referred that really don't want to try, but they have such severe medical problems that their doctor really wants them to at least hear about this, so -- and in my other practice, my practice of general internal medicine, I see patients every day who are -- continued smokers despite my best attempts to advise them on that. And so I see the spectrum of patients, not just one group. 11:00:28 11:00:32 11:00:34 11:00:38 11:00:42 11:00:46 11:00:50 11:00:52 11:00:54

Q. And you see patients, do you not, who have quit? 11:00:58

A. Correct. 11:01:00

Q. Over your medical career do you have any estimate 11:01:04

how many patients you have seen who told you they once smoked but they quit? 11:01:06 11:01:08

A. No, I don't have an estimate of that. 11:01:12

Q. Is it a large number of people, do you believe? 11:01:20

MS. WALBURN: Objection, form. 11:01:22

THE WITNESS: I really don't know. I have not ever tallied those numbers in that way and, I mean, in the context of what I just said earlier is 11:01:24 11:01:26 11:01:30

the world that I work in, which is a medical world. 11:01:34

I mean, I will give you an example. A patient I just saw a week or so ago who I have been seeing for 20 years, recovering alcoholic in 1975 and continues in recovery from his alcoholism, but has had every complication known -- not every, almost every complication known to the medical world related to his nicotine dependence. 11:01:36 11:01:40 11:01:46 11:01:50 11:01:52 11:01:56 11:01:58

And he continued to smoke despite all of my best efforts until basically six weeks ago when he developed metastatic lung cancer and he stopped smoking. So in your question does that count? I mean, he stopped smoking so -- I don't -- 11:02:02 11:02:04 11:02:10 11:02:14 11:02:16

MR. NIMS: Would you go back and read the question I asked the doctor. 11:02:18 11:02:20

(The record was read by the court reporter.)

THE WITNESS: Can she read my answer? 11:02:42

BY MR. NIMS:

Q. No. Would you explain to me, Doctor, how the one patient you told me about answers the question, which was is it a large number of people? 11:02:46 11:02:48 11:02:52

MS. WALBURN: Objection, form. 11:02:54

THE WITNESS: I can have her read it back but I think I answered your question at the 11:02:56 11:02:58

beginning of that, in that I haven't tallied those numbers to know -- know whether a large number or a small number have quit. I think that's what I said to begin with. I have not tallied the numbers. 11:03:02 11:03:06 11:03:08 11:03:22

BY MR. NIMS:

Q. Other than your personal experience with patients, have you ever made any study of what distinguishes people who quit without entering a program like the Mayo Clinic from people who enter a program like the Mayo Clinic? 11:03:28 11:03:36 11:03:40 11:03:44 11:03:46

MS. WALBURN: Objection, form. 11:03:48

THE WITNESS: I -- you have seen my CV so you know what I have written and what we have done. Is there one of those things you are talking about? Because I guess I am not sure -- we have done a lot of studies and I don't keep them all at the tip of my tongue. So is there something specific that you are talking about? 11:03:56 11:04:00 11:04:02 11:04:04 11:04:08 11:04:10 11:04:12

BY MR. NIMS:

Q. Well, I would think, and correct me if I am wrong, that it would be pretty important to you in structuring the program at the Mayo Clinic to help 11:04:16 11:04:20 11:04:24

people quit to understand as much as you can what distinguishes people who quit apparently fairly easily from people who have a very difficult time

and end up at a program like yours seeking professional assistance?

MS. WALBURN: Objection --

BY MR. NIMS:

Q. Is that fair?

MS. WALBURN: -- form and misstates prior testimony.

MR. NIMS: It didn't state any testimony. I don't know how I could misstate it.

MS. WALBURN: Well, then assumes facts not in evidence.

MR. NIMS: Yeah, I agree it's not in evidence that he cares, but that's my question.

BY MR. NIMS:

Q. Is it important to you what differentiates people who quit easily from people who don't?

MS. WALBURN: Objection to counsel's statements and objection to form.

MR. NIMS: Do you get paid by the objection?

MS. WALBURN: I am going to caution you, counsel, that in addition to the common rules of professionalism, we have a case management order in this case that covers conduct.

MR. NIMS: I am mindful of it. 11:05:24

MS. WALBURN: Well, I think you might want to refresh yourself about it at a break. 11:05:28 11:05:30

BY MR. NIMS:

Q. Have you made any attempt to determine what differentiates people who have an apparently easy time quitting smoking from those who have an apparently very difficult time? 11:05:34 11:05:38 11:05:40 11:05:42

MS. WALBURN: Objection, misstates the record. 11:05:44 11:05:46

THE WITNESS: We have done a lot of studies and so if you would like, we can get my CV out and we can look at it to see if there is something that comes to your mind, and then we will -- I mean, tell me which one you want to talk about and I'll talk about it. 11:05:48 11:05:50 11:05:52 11:05:54 11:05:58 11:06:00

BY MR. NIMS:

Q. Your CV is in front of you if that will assist you in answering my question. 11:06:02 11:06:04

A. Well, my CV only tells which articles we have written, it doesn't give me the text. And I will need to have more than just what -- if you have something specific, then fine, I can try to do that. 11:06:06 11:06:08 11:06:10 11:06:14 11:06:14

It is important for us to know about our patients and we do studies of a wide variety of -- 11:06:18 11:06:24

to answer a lot of different questions. 11:06:26

So I don't -- it's important to know a lot 11:06:28
of things about the patients and the research 11:06:30
subjects that we see, and I -- there is just a lot 11:06:34
here. I am just trying to figure out what you 11:06:36
wanted to know about it. 11:06:38

Q. I asked a question, I just want an answer to it. 11:06:42
And you indicated it might help you to look at your 11:06:44
CV. 11:06:46

A. No, no, no. What I said was, if you will give me 11:06:48
the specific citation in my CV that catches your eye 11:06:50
that's something that you want to talk about, then 11:06:54
we will get the article and we will talk about it. 11:06:56

I cannot recite, because there is so many 11:06:58
of them, the studies that are here and the detail on 11:07:00
those studies because there is too much. I mean, 11:07:04
that's -- so if there is one that you want to we can 11:07:08
get the article out. I mean -- you have a copy of 11:07:14
all my articles, I think. 11:07:16

Q. I do not know whether your CV contains such a study 11:07:20
or not, Doctor. My question is, have you made any 11:07:22
study to determine what differentiates those people 11:07:26
who quit easily from those people who report they 11:07:28
have a very difficult time in quitting? 11:07:32

MS. WALBURN: Objection, form, asked and 11:07:34

answered. 11:07:34

THE WITNESS: We have done a lot of 11:07:36
studies and you have a copy of all those studies. 11:07:38
If you will just tell me which one you want to talk 11:07:40
about we will pull it out and talk about it. 11:07:42
We have done studies on a wide range of 11:07:44
things that have to do with stopping smoking. 11:07:48

BY MR. NIMS:

Q. Is that the best answer you can give me to my 11:07:52
question? 11:07:52

MS. WALBURN: Objection, form. 11:07:54

THE WITNESS: Without having more 11:07:56
specifics, that's the best answer I can give. 11:08:00

BY MR. NIMS:

Q. If I could direct your attention, Doctor, to page 7 11:08:32
of your report. 11:08:34

A. Okay. 11:08:34

Q. Near the bottom of page 7 you write, "The release of 11:08:56
Dopamine in the mesolimbic system and nucleus 11:09:00
accumbens area of the brain is associated with the 11:09:02
pleasure and reward phenomenon observed with drugs 11:09:06
of addiction such as nicotine, opiates and 11:09:08
cocaine." 11:09:10

A. Uh-huh.

Q. Do those three substances that you reference there, 11:09:12

nicotine, opiates and cocaine, all work in the same 11:09:16
way in the mesolimbic system, as far as you know? 11:09:20

A. Well, the statement, I think, is the best knowledge 11:09:24

about that, and that is the release of Dopamine in those three areas is something that happens with those three drugs of dependence. That's -- I mean, that's kind of what it says. 11:09:28 11:09:30 11:09:34 11:09:36

Q. I agree, that's what it says. 11:09:38

A. Yep. So then -- -- 11:09:40

Q. My question is, do the three substances work in the same way to release Dopamine in the mesolimbic system and nucleus accumbens? 11:09:44 11:09:48 11:09:50

MS. WALBURN: Objection to form, asked and answered. 11:09:54 11:09:54

THE WITNESS: There could be differences, but the basic mechanism is the release of Dopamine which has is to do with the pleasure and reward system, and that's the common final pathway as far as these drugs of dependence. 11:09:56 11:09:58 11:10:00 11:10:04 11:10:04

BY MR. NIMS:

Q. You say "there could be differences." Do you know whether or not there are differences? 11:10:10 11:10:12

A. I would have to go back and refresh my memory as far as the absolute articles that refer to this, which are cited in the back, here. I could do that and 11:10:18 11:10:22 11:10:26

see. 11:10:32

Q. Do you think it's important whether or not there are differences? 11:10:32 11:10:34

MS. WALBURN: Objection, form. 11:10:34

THE WITNESS: I think the importance is 11:10:36

that they release Dopamine. 11:10:38

BY MR. NIMS:

Q. And if they -- 11:10:40

A. Or they may actually release Dopamine or inhibit its reuptake, there are different factors there, but the fact that Dopamine is the neurotransmitter in question that has to do with pleasure and reward is the central issue. 11:10:44 11:10:48 11:10:50 11:10:54 11:10:54

Q. When you drink a cup of coffee, does that release Dopamine? 11:10:58 11:10:58

A. I guess I don't know for sure. 11:11:02

Q. When you run, does that release Dopamine? 11:11:08

A. Running causes release of neurotransmitters, but I don't know about Dopamine. 11:11:12 11:11:14

Q. When you eat food does it release Dopamine? 11:11:16

A. I don't know. 11:11:18

Q. When you watch a sporting event and you care about the outcome, does that release Dopamine? 11:11:28 11:11:30

A. It raises adrenaline. It could release other neurotransmitters, but I guess I don't know. That's 11:11:34 11:11:36

not something I have studied. 11:11:40

Q. When you are helping people at the Mayo Clinic stop smoking, is there any point in the process at which you measure the Dopamine release in their brains that they get when they smoke? 11:11:48 11:11:52 11:11:56 11:11:58

A. It's -- no, is the short answer, because it requires putting things in the central nervous system to measure those sorts of things, and most of our 11:12:06 11:12:10 11:12:12

patients don't volunteer for brain biopsies and things as long as they are still alive. 11:12:16 11:12:18

Most of the work has been done in animals and such. 11:12:20 11:12:20

Q. Do you believe that there is a difference in a person who smokes a pack a day for 30 years and quits without assistance and a person who smokes a pack a day for 30 years and enters your program because he is having a very difficult time in quitting? Do you believe there is a difference in the Dopamine release in their respective brains when they smoke? 11:12:28 11:12:32 11:12:36 11:12:40 11:12:44 11:12:46 11:12:48 11:12:48

A. There is no way of knowing that for certain. There are differences in people, and -- but whether or not it has to do with their ability to stop smoking without formal assistance, it's possible, but I don't know of any evidence, any scientific evidence, 11:12:54 11:13:00 11:13:04 11:13:08 11:13:12

to speak to that. 11:13:14

Stopping smoking is too complex -- it's not just -- everybody has heard a story about Uncle Charlie who was driving down the road with his pickup and threw his cigarettes out and never looked back, everyone has heard a story about that. 11:13:18 11:13:20 11:13:22 11:13:24 11:13:26

But the more common story is not that, the more common story is they have tried to stop, tried to stop, and haven't been able to do that. 11:13:28 11:13:32 11:13:32

So stopping smoking is a process. And 11:13:36

what is it that ends up making that person able to succeed this time where they haven't been able to do it before? It's a very broad and multifactorial sort of issue. 11:13:40 11:13:42 11:13:50 11:13:52

Q. Is the fact that you believe smoking -- or strike that. 11:13:56 11:13:58

Is the fact that you believe nicotine is properly characterized as addictive important to you in how you conceptualize helping a person quit? 11:14:00 11:14:06 11:14:12

Does the use of the term addictive matter to you in how you structure a program to help him quit? 11:14:14 11:14:16 11:14:16

A. It's important for the provider, me or the physician or the counselor, to understand the addictive process and that nicotine is a drug and it's a drug 11:14:22 11:14:24 11:14:28

of dependence to structure the program so that there is addictive -- addictions treatment in kind of the generic sense that we have learned about over the last 30 years in treating other drugs of dependence. 11:14:32 11:14:36 11:14:40 11:14:42 11:14:42

It's also important for the patient and for the patient's family to understand we are dealing with an addictive disorder and not something else, because it does put it into the right context, that this is a very difficult problem and difficult for this individual patient to do. 11:14:46 11:14:46 11:14:48 11:14:52 11:14:56 11:14:58

So it's important for us all to be on the same page. 11:15:00 11:15:00

Q. When a person enters the program at the Mayo Clinic for helping in smoking cessation, do you tell them that it's an addiction and it's not your responsibility to quit and you are not going to be able to do it? 11:15:06 11:15:12 11:15:14 11:15:18 11:15:20

MS. WALBURN: Objection, form. 11:15:22

THE WITNESS: Well, you know, as I said earlier, we see, you know, 14 to 16,000 patients a year, new ones, and we talk to them in terms of the addictive potential of nicotine and how it has influenced their lives and try to use that to help them to stop smoking. 11:15:24 11:15:28 11:15:32 11:15:36 11:15:42 11:15:44

BY MR. NIMS:

Q. At some point in the process do you tell them that if you want to stop, you can? 11:15:46 11:15:48

A. We encourage everyone to think that they can do this, but we also have to be realistic and we are realistic about it as far as the numbers of people who are able to stop versus those who are not able to stop. 11:15:52 11:15:56 11:15:58 11:16:00 11:16:00

Q. Do you tell any of the people who come through your program at any point in the process that you don't believe they are capable of stopping? 11:16:06 11:16:12 11:16:12

A. I don't recall ever doing that. 11:16:18

Q. It's fair to say, isn't it, that no matter how hard a time they are having, it's important that you tell them, "You can do it"? 11:16:22 11:16:26 11:16:28

A. It's important for them to understand that there is help. It's just like people who are alcoholic. I mean, it's when do you stop trying to help them? As a provider of services -- like lung cancer, just because they got the recurrence of the lung cancer the second or the third or the fourth time do we finally say we are through? We try to do the best we can. 11:16:30 11:16:32 11:16:38 11:16:42 11:16:46 11:16:48 11:16:52

And the same thing is true with people who are smokers. If they are there before us and we 11:16:54 11:16:56

want to try to help them stop, we try to give them that encouragement. Hope is a real important part of all this. That's one of the things that's important in medicine, is hope. 11:17:00 11:17:02 11:17:04 11:17:06

Q. Is motivation important? 11:17:08

A. Motivation is important. 11:17:08

Q. Do you tell the people that? 11:17:10

A. Oh, I think we don't tell them straight up about motivation being important. We try to do something called motivational interviewing where we actually try to motivate them with our counseling skills. 11:17:14 11:17:18 11:17:20 11:17:26

Motivation can be derived from a lot of different ways. As I said earlier, if you wake up in the intensive care unit with burn marks on your chest, that's pretty motivating all by itself. But the facts are that only about half of those people that have an MI and survive it stop smoking, if they were smokers before. 11:17:28 11:17:30 11:17:34 11:17:36 11:17:38 11:17:42 11:17:44

So motivation is something we try to capitalize on as best we can. 11:17:46 11:17:48

Q. Out of the thousands of patients that have passed through the Mayo Clinic how many had burn marks on their chest? 11:17:50 11:17:56 11:17:56

A. Lots of them. 11:17:58

Q. How many? 11:17:58

A. I don't know. 11:18:00

Q. You indicated, Doctor, I believe, that you have had some experience, also, in treating people to help them get off alcohol? 11:18:16 11:18:20 11:18:22

A. In my training. That was one of the first things that I did in my training, and then, also, I worked with that addictions unit as a medical consultant for the first part of my career until I got more involved in nicotine dependence treatment. 11:18:26 11:18:30 11:18:32 11:18:36 11:18:38

Q. How does helping somebody quit using alcohol if alcohol has become a problem for them differ from helping somebody get off smoking? 11:18:44 11:18:48 11:18:50

A. Oh, I think there is more similarities than there are differences. The similarities are understanding the addictive process and providing what we talked about just then, the motivation through motivational interviewing techniques, understanding the withdrawal symptoms that are going to occur and how to deal with those, understanding tolerance, understanding the addictive nature of the problem, 11:18:54 11:18:56 11:19:02 11:19:04 11:19:06 11:19:08 11:19:10 11:19:12

understanding the continuing to drink while developing alcoholic -- liver disease or cirrhosis, is similar to continuing to smoke despite having developed emphysema. 11:19:16 11:19:20 11:19:24 11:19:24

All those things are really more 11:19:26

similar than they are different. In fact, a lot of the techniques we use in our most intensive treatment program, inpatient program for nicotine dependence -- a lot of those are based on what we have learned about how to treat alcoholism and other drugs of dependence from, you know, 20 years ago as it has evolved. 11:19:30 11:19:32 11:19:34 11:19:44 11:19:46 11:19:46 11:19:46

So to answer your question specifically, there are more similarities than there are differences. 11:19:48 11:19:48 11:19:48

Q. In helping somebody quit using alcohol if it's become a problem for them do you use any kind of alcohol replacement therapy? 11:19:52 11:19:54 11:19:56

A. No, but Naltrexone is something that's used more frequently now, and Antabuse is used as a pharmacologic adjunct. And in the acute withdrawal phase, benzodiazepines are used to treat the withdrawal symptoms. And so there is a variety of pharmacologic treatments. 11:20:00 11:20:04 11:20:08 11:20:10 11:20:14 11:20:14

But quite frankly, we have the advantage of having more of those kind of treatments in the treatment of nicotine dependence than they do, though they are beginning to develop more 11:20:16 11:20:20 11:20:22 11:20:24

pharmacologic adjuncts. 11:20:28

Q. And the pharmacological agents you mentioned for 11:20:30

alcohol, their purpose is to make alcohol less 11:20:36
desirable, that's how they work, they are not 11:20:40
designed to replace alcohol; is that fair? 11:20:42
A. Well, for the benzodiazepines that are used during 11:20:48
the withdrawal process, they basically are being 11:20:50
used to reduce the withdrawal symptoms, and in that 11:20:56
sense it's a replacement for the alcohol to reduce 11:21:02
the withdrawal symptoms. And that's why and that's 11:21:04
how we use nicotine replacement therapy. 11:21:06
The difference there is that we use it for 11:21:10
a bit longer because the potential for addiction to 11:21:16
a nicotine replacement therapy like patches or gum 11:21:18
is very low compared to smoking a cigarette. And 11:21:22
the same thing would be true -- would not be true 11:21:24
talking about benzodiazepines in people who are 11:21:28
alcoholic. They would more likely become dependent 11:21:30
on that. 11:21:30
MR. NIMS: I think we need to take a 11:21:32
break, Doctor, so the technician can change the 11:21:34
tape. 11:21:34
THE WITNESS: Okay. 11:21:36
MS. WALBURN: Is it possible he can just 11:21:38
pop in another tape and we can keep going? My 11:21:40
concern is that, as you know, it's 12 hours of 11:21:42
testimony over two days of time. I just want to 11:21:46

make sure we keep moving. 11:21:46

VIDEOGRAPHER: This concludes the first 11:21:48
tape in the videotape testimony of Dr. Hurt. The 11:21:52
time is now 11:29 -- I am sorry, 11:21 a.m. 11:21:58

(A discussion was held off the record.)

VIDEOGRAPHER: We are back on the video record. This is the second tape in the videotaped testimony of Dr. Richard Hurt.

The time is now 11:26 a.m.

BY MR. NIMS:

Q. Doctor, if I could direct your attention to page 11 of your report.

A. Okay.

Q. Now, you indicate at the bottom of page 11 that the 1964 Surgeon General's Report found that smokers smoke for the psychoactive effects of smoking but concluded that tobacco use was an habituation rather than an addiction.

A. Uh-huh.

Q. Do you recall the reasons why the 1964 report reached that conclusion?

A. Oh, I suspect there are a lot of reasons but I've not had -- I would literally have to go back and look at it. So if you have got it, we can go look

at it. There obviously were a variety of reasons that went into that. So if you have got some specific question, we can talk about that.

(Defendants' Deposition Exhibit 2453 was marked for identification.) 11:26:16

BY MR. NIMS:

Q. Doctor, I have handed you a document which I will represent to you is Chapter 13 out of the 1964 Surgeon General's Report. If you could take just a moment to look at it and familiarize yourself with it, I will have some questions about it. 11:28:14 11:28:16

A. Okay. Okay. 11:29:00

Q. Doctor, if I could direct your attention to pages 350 -- 11:29:04 11:29:06

A. Okay. 11:29:08

Q. -- and 351. Let me ask you first, have you ever read this chapter before? 11:29:14 11:29:16

A. Uh-huh. I have read it before, yes. 11:29:18

Q. Do you recall when most recently you looked at it? 11:29:24

A. Oh, probably most recently within the last couple of months or maybe three months. I haven't looked at it like yesterday but I have read it within the context of some of this activity. 11:29:26 11:29:30 11:29:32 11:29:36

Q. At the bottom of page 350 the Surgeon General's Report says, "The World Health Organization Expert 11:29:42 11:29:46

Committee on Drugs Liable to Produce Addiction 11:29:50

created the following definitions which are accepted throughout the world as the basis for control of potentially dangerous drugs." 11:29:52 11:29:56 11:29:56

And then it provides those definitions over on the next page. 11:29:58 11:30:00

A. Uh-huh, yeah. 351, yeah. 11:30:04

Q. Do you have any reason to disagree that as of the time of the issuance of the 1964 Surgeon General's Report, that was an accurate statement? 11:30:06 11:30:10 11:30:12

A. Actually, there was a fair amount of evidence speaking to nicotine as a drug dependence at that time. It's hard to tell from the way the report was done, they relied mostly on the WHO report, I think, that had been defined prior to the Surgeon General's Report, and there was evidence -- or there was written evidence about nicotine as an addictive substance. 11:30:20 11:30:26 11:30:30 11:30:36 11:30:38 11:30:40 11:30:44 11:30:48

Actually, a lot of it is in the internal documents that we have reviewed, which have to do with what was not made public prior to that time. So -- 11:30:50 11:30:52 11:30:56 11:30:56

Q. If I could interrupt, Doctor. Believe me, we will come to nicotine and those documents. I do want to talk about those. 11:31:00 11:31:10 11:31:12

But my question right now is just do you have any reason to disagree with what the Surgeon General said at the bottom of page 350, that the World Health Organization definitions for drug 11:31:12 11:31:14 11:31:16 11:31:16

addiction and drug habituation were at that point in time accepted throughout the world? 11:31:20 11:31:22

A. I have no reason to doubt that. I mean, I guess I don't know for certain it was -- what "throughout the world" means. It was an accepted definition, just like the DSM-IV right now is the accepted definition in 1997. This is, you know, 30-some-odd years ago. 11:31:28 11:31:30 11:31:32 11:31:36 11:31:40 11:31:40

Q. Turning over, then, to page 351, does that page set out what the World Health Organization meant by the term drug addiction, and then juxtaposed against that on the other column, what the World Health Organization meant at that time by drug habituation? 11:31:46 11:31:52 11:31:56 11:32:00 11:32:02

A. I think this is almost verbatim what the World Health Organization had said but I would have to get the World Health Organization document to know for sure. I think this is pretty much verbatim what the WHO had said, which means that the people that did the Surgeon General's Report really didn't modify it very much. 11:32:06 11:32:08 11:32:12 11:32:14 11:32:18 11:32:22 11:32:22

Q. Do you have any basis for believing that the Surgeon 11:32:28

General's committee needed information from the tobacco industry in order to set forth what the definition of drug addiction and what the definition of drug habituation was? 11:32:36 11:32:40 11:32:44 11:32:46

A. I think it would have helped in the context of the discussions of the committee to have known what the 11:32:48 11:32:52

tobacco industry knew and I think that would have helped in the process. 11:32:56 11:32:58

It also probably would have helped in the process to really understand the people that were on the committee and talking about a historic time and a departure from what had been thought before. 11:33:00 11:33:02 11:33:06 11:33:10

And it was a -- that's a pretty amazing document all by itself to get as far as they did. 11:33:12 11:33:16

Q. Again, my question, Doctor, is, do you believe the Surgeon General's committee needed input from the tobacco industry in order to define the terms drug addiction and drug habituation as were then defined by the World Health Organization? 11:33:20 11:33:24 11:33:28 11:33:32 11:33:34

MS. WALBURN: Objection, asked and answered. 11:33:36 11:33:36

THE WITNESS: I think they did have, actually, input into the process. 11:33:38 11:33:42

As I recall, the tobacco industry had the right of veto on the members of the committee, so 11:33:44 11:33:46

that the industry actually could have influenced the process at its outset. Now, whether or not they did, I don't know. 11:33:50 11:33:54 11:33:54

To answer your question specifically, had the committee had the knowledge that the internal documents of the tobacco industry have which talk about nicotine as a drug of dependence, nicotine as an addicting substance, had they had that before them I am not sure that the conclusions would have 11:33:56 11:34:00 11:34:04 11:34:06 11:34:10 11:34:12

been the same. 11:34:14

BY MR. NIMS:

Q. We will come to that, I assure you. But that's not my current question. 11:34:18

My current question is, and let me try and repeat it again. Do you believe that the committee needed information from the tobacco industry in order to define the terms drug addiction and drug habituation as were then, according to their own words, accepted throughout the world by a definition created by the World Health Organization Expert Committee on Drugs Liable to Produce Addiction? 11:34:22 11:34:24 11:34:30 11:34:34 11:34:38 11:34:44 11:34:48 11:34:52

MS. WALBURN: Objection, asked three times now and answered twice. 11:34:56 11:34:56

MR. NIMS: It hasn't been answered, I believe. 11:34:58

THE WITNESS: It would have helped the committee to have known what your client knew at that time to understand the addictive process, and nicotine is a drug of addiction. It would have influenced the process and they might have changed the definitions had they known then what we know now was in the internal documents. 11:34:58 11:35:02 11:35:04 11:35:06 11:35:08 11:35:14 11:35:16

BY MR. NIMS:

Q. Doctor, if you were going to rely on somebody to provide the world's definition of addiction, would you prefer to rely on the World Health Organization 11:35:20 11:35:26 11:35:30

or the tobacco industry? 11:35:30

A. In this situation, there was information that was available to the tobacco industry. It was not made available to the committee trying to decide this. 11:35:34 11:35:38 11:35:40

Furthermore, the tobacco industry had veto power on the membership of the committee that decided this to begin with. So at that point if there was any signs at all in the tobacco industry that spoke to this issue, if they would have put it on the table, then that might have influenced the process. In fact, it probably would have influenced the process. 11:35:44 11:35:46 11:35:50 11:35:52 11:35:56 11:35:58 11:36:02 11:36:02

Q. Doctor, did the tobacco industry have veto power over who was on the World Health Organization Expert 11:36:06 11:36:08

Committee on Drugs Liable to Produce Addiction? 11:36:12

A. The tobacco industry had influence over a lot of people and a lot of processes. I don't have a clue as to whether they had influence over that process. They sure did on this one. 11:36:14 11:36:16 11:36:20 11:36:22

Q. And you think it was their veto power that caused the Surgeon General's committee to use the World Health Organization definition rather than some other definition? 11:36:24 11:36:28 11:36:30 11:36:30

MS. WALBURN: Objection, misstates the testimony. 11:36:34 11:36:34

THE WITNESS: I don't think their veto power had to do with that necessarily. It could have. Who knows? I don't know who they vetoed if 11:36:36 11:36:38 11:36:42

they vetoed members of the committee, but it 11:36:44
certainly was an influencing factor. 11:36:46
But the facts are that there was internal 11:36:48
documents from 1962 from the tobacco industry that 11:36:52
talk about nicotine as a drug of dependence and an 11:36:54
addicting substance, and that was not made known to 11:37:00
the committee. 11:37:00
Had it been made -- had there been full 11:37:02
disclosure about what your client knew and when they 11:37:06
knew it, then that could have changed this 11:37:08
definition, absolutely. It would have influenced 11:37:10

the process. 11:37:10
BY MR. NIMS:
Q. It would have changed the World Health Organization 11:37:12
definition of addiction? 11:37:12
A. We are not talking about the World Health 11:37:16
Organization, we are talking about the Surgeon 11:37:18
General's Report, which came after the World Health 11:37:20
Organization report, which was sometime before 11:37:22
that. And they endorsed that because they looked 11:37:28
upon that as the best definition with the available 11:37:30
public information. 11:37:32
What I am saying is had they had access to 11:37:34
your internal documents, that might have changed the 11:37:36
course of this report and, in turn, might have 11:37:40
changed the course of history. 11:37:42
Q. What definition, Doctor, do you believe the Surgeon 11:37:46

General's committee in 1964 should have used for the term addiction? 11:37:50 11:37:52

A. I think had they had access to your company's internal documents that they would have looked at this definition called drug habituation and they would have known, having looked at information from 1962, from the internal documents, that tobacco use as a delivery device for nicotine would not fit under the terms drug habituation. 11:37:56 11:37:58 11:38:02 11:38:04 11:38:08 11:38:12 11:38:18

It would not fit at all under those terms, because there is tolerance, and your client knew it; there is physical dependence, and your client knew it; they just forgot to tell anyone, especially this committee that was deciding how to deal with this issue. 11:38:20 11:38:26 11:38:28 11:38:32 11:38:34 11:38:36

So if you look at the right side of that column, "Drug Habituation," and knowing what we know from your internal documents on how that fits into this, they could not have concluded that nicotine was habituating, they would not have concluded that at all. 11:38:38 11:38:40 11:38:42 11:38:46 11:38:48 11:38:50

Q. Let me ask my question again, Doctor. What definition of drug addiction do you believe the 1964 Surgeon General's committee should have used instead of the one then in effect throughout the world authored by the World Health Organization? 11:38:54 11:38:58 11:39:02 11:39:04 11:39:08

A. What this committee was charged to do was to look at the health effects of smoking, one part of which is 11:39:12 11:39:14

its use and its use patterns. 11:39:18

My opinion is had they had access to the 11:39:20
internal documents, they might have changed the 11:39:22
definition as was written by the World Health 11:39:26
Organization, because these were scientists, too, 11:39:30
charged to define as best they could based on the 11:39:32

available scientific literature to define these 11:39:36
issues having to do with lung cancer, heart disease 11:39:38
and, also, the addictive potential. 11:39:40

So they didn't have that information, it 11:39:42
wasn't given to them, so they may have come to the 11:39:46
wrong conclusion. 11:39:46

Q. Have you identified to the best of your knowledge 11:39:52
all of the industry documents that you believe might 11:39:58
have caused the Surgeon General committee to change 11:40:00
the definition of addiction if they had had access 11:40:04
to them someplace within the confines of the 21 11:40:12
substantive pages of your report? 11:40:14

MS. WALBURN: Objection, form. 11:40:16

THE WITNESS: All is a lot, and I have 11:40:18
reviewed a lot of documents. I have reviewed and 11:40:22
written a lot. But I have not reviewed everything 11:40:24
because it's just a lot, and so -- but I have 11:40:28
reviewed things that really are important when it 11:40:32
comes to this issue having to do with how this 11:40:36
works. 11:40:36

I mean, it's -- we are talking about -- we 11:40:40

are talking about documents that say things like -- they use the word "addictions," they use the word "dependence" in documents written long before this report was ever written. 11:40:48 11:40:52 11:40:54 11:40:56

BY MR. NIMS:

Q. Again, Doctor, we are going to talk about specific documents. I am not by any means trying to preclude your right to do that. 11:40:58 11:41:02 11:41:04

But my question right now is, are you aware of any documents that you have reviewed from the tobacco industry files that you believe, had they been provided in 1964 to the Surgeon General's committee, might have caused them to use a different definition of drug addiction that are not referenced in your report? 11:41:08 11:41:12 11:41:16 11:41:20 11:41:24 11:41:28 11:41:30

MS. WALBURN: Objection, form. 11:41:34

THE WITNESS: You have to -- I don't know -- you have too many parts to that question. I need to have you -- to give me the specific question because I have reviewed a lot of documents but I haven't reviewed all the documents. 11:41:34 11:41:36 11:41:42 11:41:44 11:41:46

BY MR. NIMS:

Q. Let me try it again and let me preface it by saying what I am not asking. I am not asking for every industry document that you have looked at that you believe is important. 11:41:52 11:41:54 11:41:58 11:41:58

What I am asking is, does your report identify all industry documents that you believe, 11:42:02 11:42:06

had they been made available in 1964 to the Surgeon

General's committee, might have caused them to adopt a different definition of drug addiction?

A. My report -- I think you have been given the listing of the documents that I have reviewed. You have a listing of those. Because they are not all --

Q. That's broader than your report. But yes, I do have a list of those.

A. But my report talks about the documents we are going to review, and there is more than -- in fact, my -- the document -- my report really talks about the scientific literature that I have reviewed. And we say in the report that it includes documents that your client has given. And so that's a separate listing but it's implicit in the report that the document review is there and it's ongoing. I am continuing to review documents, so --

Q. I understand that.

A. So what's the question?

Q. And all I can ask you today, on August 19th, is the state of your opinions and knowledge on August 19th.

I understand your review is continuing.

A. Uh-huh.

Q. But as of today, August 19th, the day I get to ask these questions, are the documents that you believe

might have influenced the Surgeon General's committee in 1964 to change the definition of addiction -- are they referred to in your report or are there other ones that are on this broader list of all the documents you reviewed? 11:43:32 11:43:36 11:43:42 11:43:44 11:43:46

A. The documents are in that listing as far as the way we have put that all together. I mean, all the documents I reviewed or all the documents I have had are in that report, in the report you have in your hand. 11:43:50 11:43:56 11:43:58 11:44:02 11:44:02

In my expert report it's just examples of some of the things that come from these, so the expert report does not include all of those documents. 11:44:06 11:44:10 11:44:12 11:44:14

Does that answer your question? 11:44:14

MS. WALBURN: And can I just make sure the record is clear that when Dr. Hurt is referring to the report in counsel's hand he is referring to the computer listing of documents by Bates numbers. And maybe it would be appropriate to mark that for the record so there is no misunderstanding. 11:44:18 11:44:20 11:44:22 11:44:26 11:44:30 11:44:32

MR. NIMS: Yeah, I -- unfortunately, I didn't bring copies of this one, but -- 11:44:32 11:44:34

MS. WALBURN: We can get it copied at a break. 11:44:38 11:44:38

(Defendants' Deposition Exhibit 2454 was marked for identification.) 11:44:58

THE WITNESS: So I am assuming this is the complete report. It looks like it is. So -- but it just has numbers as far as -- 11:45:00 11:45:02 11:45:06

BY MR. NIMS:

Q. There has actually been a letter we have received since then that listed a few more documents that aren't on that, and I don't think I have that with me, but I am aware that it exists. 11:45:10 11:45:14 11:45:18 11:45:22

A. So to answer your question, this is the inclusive list of the documents that I have reviewed, and in my expert report all of these documents are not mentioned. 11:45:26 11:45:30 11:45:32 11:45:34

For example, if you look at page 13, then there is certain documents that are cited, which should be on this list, but they are not -- there are more on this list than are in the expert report. Is that your question? 11:45:40 11:45:42 11:45:48 11:45:52 11:45:52

Q. No. I understand that to be the case. Let me go now to my question. 11:45:56 11:45:58

We have marked as an exhibit, Doctor, the broader list of at least as of the time that you provided your report -- the broader list we have now marked as Exhibit 2454 were the documents that you 11:46:00 11:46:04 11:46:08 11:46:16

had reviewed as of the time that you provided us your report. 11:46:20 11:46:20

A. Uh-huh. 11:46:22

Q. Do you believe that on that list there are additional documents other than those that are enumerated in the report, itself, which, had they been available in 1964 to the Surgeon General's committee, might have caused the committee to change the definition it was using of drug addiction? 11:46:24 11:46:28 11:46:34 11:46:38 11:46:42 11:46:44

MS. WALBURN: Objection, asked and answered. 11:46:46 11:46:46

THE WITNESS: Yeah, I don't -- you know, I don't know -- you know, these are just examples of the documents that I have looked at as far as what's in my expert report. 11:46:48 11:46:50 11:46:52 11:46:54

Whether or not there is something in some of the other documents that aren't in my expert report, I would have to go back and look at them. I mean, this is a lot of documents I have looked at and so certain things come out when you look at them initially and go back and review them later and you find other things. 11:46:56 11:47:00 11:47:04 11:47:06 11:47:08 11:47:10 11:47:14

So it's -- this is a -- could be a continual process. So it doesn't have a start and end, so I -- there could be, is the best answer I 11:47:14 11:47:18 11:47:20

can give you. 11:47:22

BY MR. NIMS:

Q. "Could be" doesn't help me a lot. I understand. 11:47:26

A. Well, for example, "If this had been known to the Surgeon General, as a result of these various 11:47:28 11:47:30

researches, we now possess a knowledge of the effects of nicotine far more extensive than exists in the published scientific literature. It is indeed so extensive and represents so much new thought that it's not easy to condense the material on these several reports and working papers without the risk of oversimplification." 11:47:32 11:47:44 11:47:46 11:47:48 11:47:52 11:47:54 11:47:58

And there are other words in here prior to actually the early 1960s that talk about nicotine is a drug of dependence, nicotine is a drug of addiction, and so on. And so had those things been known to the Surgeon General and had they been publicly known to them, they very well might have changed this definition. 11:48:02 11:48:04 11:48:06 11:48:10 11:48:12 11:48:16 11:48:18

They might have overridden the World Health Organization because that was their charge, was to look at what was existing scientific knowledge. And unfortunately for all of us, your companies just forgot to tell them. 11:48:20 11:48:22 11:48:24 11:48:30 11:48:32

And I think they agreed actually to do

that, they said that they were going to cooperate with the Surgeon General's committee and provide them with information, but they consciously did not do that. 11:48:36 11:48:38 11:48:40 11:48:42

MR. NIMS: Objection, move to strike the answer as non-responsive. 11:48:44 11:48:48

BY MR. NIMS:

Q. Let me try it this way, Doctor. I take it that we can agree that the universe of documents that you have looked at which could conceivably have impacted the Surgeon General's choice of definition in 1964 would have to be documents that came into existence before 1964? 11:48:54 11:48:58 11:49:02 11:49:08 11:49:14 11:49:16

A. So if the question is in order to influence a process it had to exist before 1964 -- is that your question? 11:49:22 11:49:24 11:49:26

Q. Correct. We can at least agree that any document you think if the Surgeon General had seen he might have written something different on page 351 of the '64 report it has to be a document that existed before that? 11:49:30 11:49:32 11:49:34 11:49:40 11:49:40

A. It had to be a document that existed before then, I can agree with that. And there were several. 11:49:42 11:49:46

Q. Well, why don't you tell me at least by document the several that you believe, had they been made 11:49:52 11:49:56

available to the Surgeon General's committee, might have impacted on the definition that they used on page 351 of the report. 11:50:00 11:50:02 11:50:04

A. I only have a few. I mean, I have not looked at all the documents. There is a huge number of them and I have only looked at a few, so -- but the one I just read you was on page 301083828 having to do with possessing the most extensive research on tobacco and nicotine. 11:50:08 11:50:12 11:50:14 11:50:20 11:50:24 11:50:24

Q. And whose document is that? 11:50:28

A. That's a B.A.T. document, according to the bottom of this, having to do with the Madhatter project and it's written by Sir Charles Ellis, I think, is who the author was. "The Effects of Smoking, Proposal for Further Research Contracts with Battelle," dated February 13th, 1962, labeled "Private and Confidential." 11:50:30 11:50:34 11:50:38 11:50:44 11:50:48 11:50:52 11:50:54

"We believe that we have found possible reasons for addiction in two other phenomenon that accompany steady absorption of nicotine. The experiments have so far only been carried out with rats but with these it is found that certain rats become tolerant to repeated doses and after a while show the usual nicotine reactions but only on a very diminished scale." 11:51:00 11:51:04 11:51:06 11:51:08 11:51:10 11:51:14 11:51:18 11:51:18

That's a classic definition of tolerance to a drug of addiction. 11:51:22 11:51:24

And you see up here in definition 2 under "Drug Habituation," "Little or no tendency to increase dose," and so on, has to do with tolerance. 11:51:28 11:51:32 11:51:34

So they didn't know this, that there was evidence -- I am assuming they didn't know it because if they didn't, they didn't use it to decide. But there was evidence here that in animal models they can become tolerant to the effects of nicotine. 11:51:40 11:51:42 11:51:44 11:51:48 11:51:50 11:51:52

In fact, they use the word "The 11:51:54

interesting point is that these tolerant or nicotine conditioned rats are found to have a greatly enhanced power of detoxification." That's just one -- 11:51:56 11:51:58 11:52:02 11:52:02

Q. Is that still the same document that you have identified for the record? 11:52:04 11:52:04

A. That was on page 301083829. 11:52:10

MR. PURDY: I am sorry, can you just repeat the numbering? 11:52:12 11:52:14

THE WITNESS: Say again? 11:52:14

MR. PURDY: Can you just repeat the number? 11:52:18 11:52:18

THE WITNESS: Don't you have these? 11:52:20

MR. PURDY: Can you just repeat the number? 11:52:22 11:52:22

THE REPORTER: 301083829. 11:52:30

BY MR. NIMS:

Q. Recognize right now, Doctor, all I am trying to do is -- 11:52:32 11:52:32

A. And I am just giving you examples. There may be other -- 11:52:34 11:52:36

Q. -- get you to identify by document, title number, some way so we know what it is, those documents that you presently believe are documents of the kind we have been discussing over the last ten minutes. 11:52:40 11:52:42 11:52:46 11:52:48

A. Well, there is another representative if you want one more, but there is a bunch of things here. 11:52:52 11:52:54

This is Brown & Williamson, it looks like, 11:52:58

May of 1963 entitled, "A Tentative Hypothesis on Nicotine Addiction." 11:53:14 11:53:14

I mean, that's pretty plain English. 11:53:20

"In the beginning of nicotine consumption relatively small doses can perform the desired action. Chronic intake of nicotine tends to restore the normal physiological functioning of the endocrine system so that ever-increasing dose levels of nicotine are necessary to maintain the desired action." 11:53:22 11:53:28 11:53:30 11:53:34 11:53:38 11:53:44

As it relates to the '64 definition, had they known this at that time, they might have considered something else in this classification. 11:53:46 11:53:48 11:53:52

In fact, and further on in this document -- that was on page 536480912 -- "This unanimous desire explains the addiction of the individual to nicotine." 11:53:54 11:54:06 11:54:10 11:54:10

We are talking about things that talk about addiction. We are not talking about hedging words. 11:54:12 11:54:14 11:54:16

"In conclusion, a tentative hypothesis for the explanation of nicotine addiction would be that of an unconscious desire," and so on. So it talks about "physiologic equilibrium," and so on. 11:54:22 11:54:26 11:54:28 11:54:32

So these are not trivial nor hard to understand words. And so it's just -- 11:54:34 11:54:38

Q. Okay. Again, Doctor, we will have questions about the documents, but -- 11:54:42 11:54:44

18 A. I just have a question. If these were available and 11:54:48
19 the industry had said that they were going to turn 11:54:50
20 them over to the Surgeon General's committee for the 11:54:52
21 1964 report, did they? 11:54:54
22 Q. Doctor, you don't know what conversations occurred 11:54:58
23 between the committee and the tobacco industry 11:55:08
24 before 1964, do you? 11:55:08
25 A. I assume that there was conversations because they 11:55:10

1 had veto power on the makeup of the committee. 11:55:12
2 Q. You don't know what conversations occurred between 11:55:12
3 tobacco representatives and the Surgeon General's 11:55:14
4 committee before 1964, do you? 11:55:16
5 A. I do know that they didn't turn over -- your clients 11:55:20
6 did not turn over documents that they had in their 11:55:22
7 possession at that time that might have influenced 11:55:24
8 the process. I do know that because these were 11:55:26
9 absent, and there is talk in some of the documents 11:55:30
10 about secrecy, about not turning over documents, and 11:55:32
11 so on. 11:55:34
12 So it is a matter of your internal records 11:55:36
13 saying that you had knowledge that your companies 11:55:40
14 decided consciously not to provide to the committee 11:55:42
15 that was trying to decide these issues. 11:55:44
16 MR. NIMS: Objection, move to strike. 11:55:48
17 BY MR. NIMS:
18 Q. Are there other documents, Doctor, that you believe 11:55:52
19 might have impacted the definition had they been 11:55:56
20 made available to the Surgeon General's committee? 11:56:00

A. Oh, there are but, I mean, how many examples do you need? 11:56:02 11:56:02

Q. I just would like to get all the ones you believe fit that criteria. 11:56:06 11:56:08

MS. WALBURN: Well, objection, this isn't 11:56:10

a memory contest. 11:56:12

MR. NIMS: He has got the documents in front of him. I am not testing his memory, I am trying to establish his opinions and the basis for them. 11:56:14 11:56:16 11:56:18 11:56:18

MS. WALBURN: Well, he has one notebook of documents in front of him. That doesn't comprise everything he has reviewed. 11:56:22 11:56:22 11:56:24

THE WITNESS: Yeah, this is just a sampling of the documents and a sample of some of the things that have to do with this as an issue. 11:56:26 11:56:28 11:56:32

And it's just hard, you know. Quite honestly, it's hard to just kind of have you make a question up and then me kind of go and try to find these things. There is a lot of verbiage here. 11:56:34 11:56:38 11:56:42 11:56:46

BY MR. NIMS:

Q. I understand. But my chance before trial to find out why you believe what you believe is solely in this two-day deposition. 11:56:48 11:56:50 11:56:54

A. Well, here is another one, 301083864. And this also has to do with -- signed by Dr. Charles -- he is a sir, right? He is a sir? Charles Ellis? I don't 11:57:02 11:57:04 11:57:08

know if he is a doctor or -- he is a senior scientist. 11:57:10 11:57:12

"Haselbach," H-A-S-E-L-B-A-C-H, "seemed 11:57:22

to think quite reasonably well of the description I had given of addiction October 25, 1961. But he, himself, felt that an alternative view could be to distinguish between the hold that cigarette smoking had on the smoker and addiction; that is, the intensity of the withdrawal symptoms." 11:57:26 11:57:28 11:57:32 11:57:34 11:57:36 11:57:38

Now, in this -- in the '64 definition they talk about some degree of physical dependence on the effect of the drug, but the absence of physical dependence and, hence, of an abstinence syndrome. 11:57:44 11:57:46 11:57:48 11:57:52

So that's under "Drug Habituation." Okay? If it's a drug of habituation it cannot have, according do this definition, an abstinence syndrome. 11:57:54 11:58:02 11:58:06 11:58:06

And here we have one of the senior scientists for one of the companies talking about the intensity -- not just presence, but the intensity of withdrawal symptoms. 11:58:08 11:58:10 11:58:14 11:58:16

So that's just another example, and there is some other verbiage on the next page that's similar to that. 11:58:20 11:58:24 11:58:24

So those are just examples. And all I have in this book are just examples and what I have written in my report are actually examples of the documents that I reviewed, so -- 11:58:30 11:58:32 11:58:34 11:58:36

Q. Does the book that you have been referring to include all of the documents -- 11:58:38 11:58:42

A. No, it does not. 11:58:44

Q. -- that are on the list we have marked as 2454? 11:58:48

A. No, it does not. 11:58:48

Q. What does the book you have been referring to represent? 11:58:54 11:58:54

A. It represents a compilation of the things that are in the report as far as the citations we have here, but it also represents my continued review of the documents looking at -- looking at -- re-reviewing some of the documents that I reviewed initially and going back through them a little bit more. 11:58:58 11:59:02 11:59:06 11:59:10 11:59:12 11:59:16

It's -- this is just a sample of the total. 11:59:18 11:59:18

MS. WALBURN: Counsel, when you are at a natural breaking point, maybe a five-minute break. 11:59:20 11:59:22

MR. NIMS: Sure. We can do it now. That's fine. 11:59:24 11:59:26

VIDEOGRAPHER: We are temporarily going off the video record. The time is now 11:59 a.m. 11:59:28 11:59:32

(A recess was taken.)

VIDEOGRAPHER: We are back on the video record. The time is now 12:06 p.m. 12:06:14 12:06:30

BY MR. NIMS:

Q. Doctor, if I could direct your attention again to page 351 -- 12:06:52 12:06:54

A. Okay. 12:06:54

Q. -- of the 1964 Surgeon General's Report. At -- near the bottom of that page the committee writes: 12:07:02 12:07:08

"Thus, correctly designating the chronic use of tobacco as habituation rather than addiction carries with it no implication that the habit may be broken easily. It does, however, carry an implication concerning the basic nature of the users and this distinction should be a clear one. 12:07:12 12:07:16 12:07:22 12:07:24 12:07:26 12:07:28

"It is generally accepted among psychiatrists that addiction to potent drugs is based upon serious personality defects from underlying psychologic or psychiatric disorders which may become manifest in other ways if the drugs are removed." 12:07:30 12:07:34 12:07:38 12:07:42 12:07:46 12:07:46

Do you believe that the tobacco industry had information available to it that had it presented to the committee would have caused them to believe that tobacco users were suffering from serious personality defects? 12:07:48 12:07:54 12:07:58 12:08:02 12:08:04

A. You know, I have reviewed a lot of documents so I don't know what the tobacco industry had available to it. 12:08:08 12:08:10 12:08:10

I would say that what may have been 12:08:12

generally accepted among psychiatrists and addiction specialists at that time as far as there being personality defects is the driving force behind addictions, that's no longer true. 12:08:16 12:08:18 12:08:22 12:08:24

We know that people have problems with personality disorders who end up using drugs, but the way this is phrased is no longer conventional wisdom on that issue. 12:08:26 12:08:30 12:08:32 12:08:34

We see people who are addicted to alcohol that are ordinary folks who just happen to be subjected to repeated doses of alcohol over time. 12:08:38 12:08:40 12:08:44

And so this premise that it is generally accepted among psychiatrists is no longer accepted amongst addiction specialists. 12:08:48 12:08:50 12:08:54

Q. And I take it that that change in the way the psychiatric community looks at addiction is a change that is across all drugs, not just nicotine? 12:08:58 12:09:04 12:09:08

A. Well, this -- then this one is particularly talking about addiction to other drugs out of the context of nicotine because they have kind of set nicotine aside. 12:09:12 12:09:14 12:09:16 12:09:18

And that is true, that the personality disorders that they are talking about here as being the underlying driving factor for the person to use 12:09:22 12:09:24 12:09:28

a substance is now well understood not to be the case and it is the drug, itself, that is the problem, not the person. 12:09:30 12:09:32 12:09:34

And the same thing is true with nicotine, that's correct. 12:09:38

Q. If I could direct your attention to page 352 -- 12:10:18

A. Okay. 12:10:18

Q. -- of the '64 report. In the paragraph there in the middle of the page -- 12:10:28

A. Beginning with "Proof"? 12:10:32

Q. Yeah. The committee discusses physical dependence. The committee says: "In fact" -- there what line, 5? 12:10:36

A. That's it, yeah. 12:10:44

Q. "In fact, many heavy smokers may cease abruptly and, while retaining the desire to smoke, experience no significant symptoms or signs on withdrawal." 12:10:48

That remains true today, does it not? 12:10:58

A. Many people can stop without having overpowering withdrawal symptoms, just as people can stop using cocaine or alcohol or other drugs without having withdrawal symptoms that are overpowering. 12:11:02

I think the important part of that is what's above. It's talking about, "Proof of physical dependence requires demonstration of a 12:11:14

characteristic and reproducible abstinence syndrome," and it doesn't say it has to occur in everyone, and, in fact, it doesn't occur in everyone from withdrawal from other drugs. 12:11:22

And had this committee had information that's contained in these documents about withdrawal 12:11:34

symptoms and nicotine as an addicting drug that the companies had, that very well could have influenced this factor because they, by their own words, that they knew more about nicotine than anybody else in the world and more than the published literature and so on. 12:11:40 12:11:44 12:11:46 12:11:50 12:11:52 12:11:52

So that there may have been things there that would have helped the committee to understand this better. 12:11:54 12:11:56 12:11:56

Q. Well, let's see what the committee, in fact, said. Let's read that first sentence, then. 12:12:00 12:12:02

"Proof of physical dependence requires demonstration of a characteristic and reproducible abstinence syndrome upon withdrawal of a drug or chemical which occurs spontaneously, inevitably." 12:12:06 12:12:10 12:12:14 12:12:20

A. Uh-huh.

Q. Does that not mean that the committee thought that it does need to occur all the time as far as the committee was concerned? 12:12:22 12:12:26 12:12:26

A. Perhaps. I mean, "inevitably" would mean almost all the time or would occur usually. I guess that would be the interpretation of "inevitably." 12:12:32 12:12:36 12:12:40

Q. But the committee did know, did it not, that there were some withdrawal symptoms that some smokers experienced and it said so, did it not, in that next sentence, "On the other hand"? 12:12:44 12:12:48 12:12:54 12:12:58

A. "On the other hand, it is well established that many 12:13:02

symptoms and a few signs which may be observed objectively by others may occur following cessation of smoking, but no characteristic abstinence syndrome occurs." 12:13:06 12:13:10 12:13:14 12:13:14

And I don't think that -- I think they just didn't have the knowledge about the abstinence syndrome and its physiological effects that this drug had that was well known to your clients. They didn't -- the committee just didn't know that. 12:13:18 12:13:22 12:13:26 12:13:30 12:13:32

I mean, you can't conclude something if you don't have the information. 12:13:36 12:13:36

Q. Well, fortunately, the committee wrote some things that allow us to learn some of what they did know. 12:13:40 12:13:44

Going on down that paragraph, the committee said, did it not: 12:13:46 12:13:48

"Rather, a gamut of mild symptoms and signs is experienced and observed as in any 12:13:52 12:13:54

emotional disturbance secondary to deprivation of desired object or habitual experience. These may be manifest in some persons as increased nervous excitability, such as restlessness, insomnia, anxiety, tremor, palpitation, and in others by diminished excitability, such as drowsiness, amnesia, impaired concentration and judgment, and diminished pulse. The onset and duration of these withdrawal symptoms are reported by different authors in terms of days, weeks, or months, obviously an inconsistency if one attempts to relate 12:14:04 12:14:06 12:14:10 12:14:12 12:14:14 12:14:16 12:14:20 12:14:24 12:14:26 12:14:28 12:14:32

these to nicotine deprivation." 12:14:34

So the committee knew all those things, 12:14:36

did it not? 12:14:36

A. They wrote it. 12:14:38

Q. And all of those things remain true today. If you 12:14:44

were to characterize what the withdrawal symptom -- 12:14:48

syndrome that sometimes accompanies tobacco 12:14:50

cessation looks like, that still describes it, does 12:14:54

it not? 12:14:54

MS. WALBURN: Objection, form. 12:14:56

THE WITNESS: There are some of these are 12:14:58

included in the current definition, and some that 12:15:02

aren't. The physiologic parts are not included 12:15:06

here, and I guess that's -- that's the part that's 12:15:10

missing. 12:15:12

But I think it's really more than just the 12:15:14

words, it really has to do with depth of the 12:15:18

understanding of this. 12:15:18

You have to remember back in 1964 over 12:15:22

half of all adult males were smokers at that time, 12:15:26

and so it was a much more prevalent condition at 12:15:32

that time, and there was very little work being done 12:15:36

to try to understand or to help people to stop 12:15:38

smoking. 12:15:40

And so though they say that the symptoms 12:15:42

may be mild, I would like for them -- the people 12:15:46

that wrote this to come to see some of the patients 12:15:48

that I see who have severe -- we had one patient actually ended up being hospitalized because of nicotine withdrawal, who was a local patient, was in one of our studies. 12:15:52 12:15:54 12:15:58 12:16:00

She stopped using the patch, had stopped smoking, ended up being hospitalized because of the severe anxiety that she had, ended up in the hospital for treatment of that. 12:16:00 12:16:04 12:16:06 12:16:08

So though they may proclaim these to have been mild at that time, I don't think they had the knowledge base that we -- that probably -- we certainly have today that may have been available to 12:16:12 12:16:12 12:16:16 12:16:20

the tobacco industry even at that time. 12:16:24

BY MR. NIMS:

Q. Would you agree, Doctor, that the withdrawal syndrome that accompanies cessation of the use of alcohol in true alcoholics is far more significant, far more medically threatening than the withdrawal syndrome experienced by some smokers when quitting smoking? 12:16:26 12:16:32 12:16:38 12:16:40 12:16:44 12:16:44

A. There is a lot of parts to that question. I guess you mentioned "true alcoholics," I am not sure what that means. 12:16:48 12:16:52 12:16:52

You need to help me focus the question a bit because the syndrome of withdrawal is highly variable and crosses all -- so if a person has had an alcoholic withdrawal seizure previously, that obviously is a severe event. 12:16:54 12:16:58 12:17:04 12:17:06 12:17:08

If a person ends up being in the hospital, hospitalized because of severe anxiety because of nicotine withdrawal, that obviously is a serious event, too. 12:17:10 12:17:14 12:17:16 12:17:18

So trying to equate those two things is hard unless you can get a little more specific. 12:17:20 12:17:22

Q. Withdrawal from alcohol can be life-threatening, can it not? 12:17:28 12:17:28

A. If a person has delirium tremens, that can be life-threatening, correct. 12:17:34 12:17:34

Q. And it's generally the case in alcohol cessation programs that if a person is showing biological withdrawal from alcohol, they are monitored very closely medically, are they not? 12:17:40 12:17:46 12:17:48 12:17:50

A. Depends on the program. In our program, they are obviously monitored closely. 12:17:52 12:17:56

Q. And certainly the same monitoring does not occur with people experiencing restlessness or anxiety when quitting smoking, does it? 12:17:58 12:18:02 12:18:06

A. People in our inpatient treatment program for their nicotine dependence, we monitor them very closely. We have actually had people transferred from the inpatient unit to the coronary care unit because we couldn't distinguish if their chest pain was coronary or if it was just anxiety. So no, that's not true what you said. 12:18:10 12:18:12 12:18:14 12:18:18 12:18:20 12:18:24 12:18:26

Q. So you believe that withdrawal from smoking 12:18:28

cessation is equally life-threatening to some people as withdrawal from alcohol? 12:18:32 12:18:34

A. That's not what I said. The severity of it is severe just like severity of withdrawal from other substances can be severe, depending upon the dose and duration of use over time. 12:18:40 12:18:42 12:18:46 12:18:48

Not all substance of dependence withdrawal is life-threatening. I mean, probably the best example is barbiturates, of which we don't see much anymore because they have been replaced with benzodiazepine. 12:18:52 12:18:58 12:19:02 12:19:04 12:19:06

But there was a seizure syndrome associated with barbiturate withdrawal that actually ended up in the death of patients. 12:19:10 12:19:12 12:19:14

So you can't characterize one versus the other for the individual person with the withdrawal symptoms, they may be very, very severe. 12:19:18 12:19:22 12:19:24

And I guess the whole point about that is that in people who experience withdrawal syndromes who then relapse to the use is probably the most damaging part, and that is a life-threatening thing especially when it comes down to smoking again. 12:19:28 12:19:30 12:19:42 12:19:44 12:19:46

If they relapse of smoking because of withdrawal symptoms, then they have got a very high likelihood of dying of tobacco-related diseases. 12:19:48 12:19:50 12:19:52

MR. NIMS: Objection, move to strike. 12:19:56

BY MR. NIMS:

Q. Let me ask you this, Doctor. Have you made any 12:19:58

study of the patients in your program at the Mayo Clinic who say their principal problem with quitting smoking is the severity of the withdrawal they are experiencing? 12:20:04 12:20:08 12:20:10 12:20:12

A. Well, we have done a lot of studies and we study withdrawal symptoms. Withdrawal symptoms is one of the factors that leads to relapse. But I guess I would have to go back and look at my CV to see if there is, quote, "a study" that has to do with that specifically. 12:20:16 12:20:22 12:20:26 12:20:28 12:20:32 12:20:32

We have studied a lot of that sort of thing, withdrawal symptoms, how they occur and such. 12:20:34 12:20:36

Q. Well, isn't it fair to say in your experience in your own program that withdrawal is not the principal impediment to successful smoking cessation? 12:20:40 12:20:44 12:20:50 12:20:50

A. I couldn't say that at all. I guess the things that impede people from stopping smoking and successfully doing that is -- there is a wide range of those things. And for that individual, whatever the impediment was is important. But trying to speculate on which five or ten or 20 are the most important, I -- that's harder to do. 12:20:54 12:20:56 12:20:58 12:21:04 12:21:06 12:21:10 12:21:14

Q. So you have, in your experience in your clinic, not reached a judgment that withdrawal is not the principal impediment to successfully stopping smoking? 12:21:18 12:21:22 12:21:26 12:21:26

A. I am not sure I follow the whole question because there are so many nots in there. But to try to 12:21:30 12:21:32

answer it, withdrawal symptoms are an important part of the smoking cessation process and they are an important reason for many people to not be able to stop smoking and to relapse to smoking if they have attained some initial abstinence. It's an important part, but it's -- there are other factors involved. 12:21:36 12:21:38 12:21:44 12:21:48 12:21:52 12:21:54

Q. When you quit in 1975 did you have withdrawal? 12:21:58

A. It was awful. 12:21:58

Q. How long did it last? 12:22:00

A. It seemed like forever, but it really wasn't that long. People at work were asking me to start smoking again, it was that bad. I was irritable to the point that I could not concentrate on a page, I could not read a scientific document, I could not read a book because of the lack of concentrating ability. 12:22:04 12:22:08 12:22:12 12:22:14 12:22:16 12:22:18 12:22:20

It went on for probably several days. I really can't remember because it was kind of a -- it was a fog. And the lead counselor at our unit said, you know, "Hurt, you need to start smoking again, this is just awful." 12:22:22 12:22:26 12:22:28 12:22:32 12:22:32

And so maybe some of the things that I -- maybe I was worse than I thought I was, but I was pretty bad. 12:22:34 12:22:38 12:22:38

Q. Did they hospitalize you during those days? 12:22:40

A. No, no, not at all. Would have been nice, but they didn't -- we didn't know very much about how to treat nicotine dependence at that stage of the game. 12:22:46 12:22:48 12:22:52

Q. And I take it during those days you continued to go to your workplace? 12:22:54 12:22:56

A. I don't -- I don't think I missed any days of work, but I -- I don't know. I don't think so, but it's been a long time ago. 12:23:02 12:23:06 12:23:06

I wasn't very effective, I can tell you that for sure, because what I just said, I mean, I was very irritable, very anxious, inability to concentrate, and I wasn't very effective in the groups. 12:23:10 12:23:14 12:23:16 12:23:20 12:23:22

The counselor took me aside saying, "You need to do something different, maybe go back to smoking." 12:23:24 12:23:26 12:23:26

Q. And if you went back to smoking tomorrow, which you indicated you think if you did you would be smoking steadily again, would the reason be to avoid withdrawal or would it be something else? 12:23:30 12:23:34 12:23:40 12:23:42

A. If I went back to smoking tomorrow I think the reason would be a biochemical reason. Because the receptors, once sensitized to the effects of these very high levels of nicotine, I am not sure they ever forget the effects that occur. 12:23:46 12:23:50 12:23:54 12:23:58 12:24:00

So it would not be to avoid withdrawal, at least initially, but if I were to start smoking again, it would sensitize the receptors that used to receive very large doses of nicotine with the pleasure and reward system that went along with that, and tolerance would come back. 12:24:06 12:24:08 12:24:14 12:24:16 12:24:18 12:24:22

And then at some point in the future I would try to stop again and then I would have withdrawal symptoms, if that answers your question. 12:24:24 12:24:26 12:24:28

But it would not be -- starting smoking again tomorrow would not be to avoid withdrawal symptoms, no. 12:24:32 12:24:34 12:24:36

Q. Whose brand did you smoke when you were smoking? I haven't asked you that. 12:24:40 12:24:42

A. Marlboro. Want to know why? 12:24:46

Q. Sure. Why? 12:24:48

A. Because of cowboys. That was a pervasive influence in my life. The ads on television were compelling. My friends smoked Marlboros. But then later on in my smoking career I switched to Belairs occasionally. I smoked Belairs one time and Marlboros the next. 12:24:52 12:24:58 12:25:04 12:25:12 12:25:16 12:25:18

At night I would put them on the bedside table. The last one I smoked would go on the bottom and the other one would go on the top, and then I 12:25:18 12:25:20 12:25:22

put my Zippo lighter on top of those just in case there was an earthquake or something. 12:25:22 12:25:24

And then the next morning I didn't have to think about which one I was going to smoke first, it would be the one that I had not smoked the last one the night before. 12:25:24 12:25:26 12:25:28 12:25:28

It was a pretty important part of my life. I never ran out of anything. Lighter fluid in the medicine cabinet, lighter fluid in the glove compartment of the car, two Zippo lighters. Preoccupation? You bet. 12:25:30 12:25:34 12:25:36 12:25:40 12:25:42

Q. And I believe -- you indicated to us you started smoking when you were in college? 12:25:46 12:25:48

A. Right. 12:25:50

Q. People smoke for more than just the administration of nicotine, don't they? 12:26:16 12:26:20

A. Why people start smoking is -- there are multiple factors in that, if that's what you are talking about. People start smoking for a lot of different reasons. 12:26:28 12:26:30 12:26:34 12:26:34

Once hooked, once that becomes the central theme of their use, then they are smoking for the nicotine. In fact, they are probably smoking for certain levels of nicotine, we have learned that over the years. 12:26:38 12:26:44 12:26:46 12:26:50 12:26:50

But the internal documents that I reviewed said that your companies knew about this a long time ago as far as smoking to a desired level of nicotine and how nicotine was a central drug and the central 12:26:54 12:26:58 12:27:00 12:27:04

importance factor. So although people may start for a lot of different reasons once they get dependent it's the substance that drives it all. 12:27:06 12:27:12 12:27:14

Q. You believe that that's the only reason you enjoyed smoking when you smoked was to get nicotine? 12:27:16 12:27:20

A. Hard to say. Maybe not at the very beginning but it wasn't very long after that because the first cigarette of the day I turned on all the lights upstairs. The computer went on. 12:27:28 12:27:30 12:27:32 12:27:34

It's -- the hit, I mean, that you receive from smoking a cigarette is a pretty awesome thing. That's one of the descriptions used by your clients, an awesome thing. Well, I can personally testify to that, that it was awesome. I never smoked a cigarette I didn't like, they were all just different grades of great. 12:27:38 12:27:44 12:27:46 12:27:50 12:27:54 12:27:56 12:27:58

Q. Did Belair and Marlboro taste alike or did they taste different? 12:28:06 12:28:06

A. They were very different. When you smoked as much as I did, smoking two to three packs of one brand a day got old about midway through the second pack. 12:28:10 12:28:14 12:28:20

And so the menthol I used because of just the main stuff in the mouth, but the hit to the brain was the same. I mean, it gave me the same feeling regardless of whether it was a Belair or a Marlboro because I inhaled very deeply. The first cigarette of the day, I could smoke it in three puffs. 12:28:24 12:28:28 12:28:32 12:28:36 12:28:38 12:28:40

Q. How long were you a two-pack-a-day smoker? I think 12:28:54

you told us two packs. 12:28:56

A. Yes, two to three packs. It just kind of blurs 12:28:58
because it's just kind of hard to keep track of 12:29:02
that, actually, because it's -- I bought them by the 12:29:04
carton. So when I would leave the house every day I 12:29:06
would have two fresh packs. I would leave the ones 12:29:10
that were unfilled at home because I didn't want to 12:29:12
run out of anything. I usually loaded up with two 12:29:14
full packs to start out with. 12:29:16

So somewhere between two and three packs a 12:29:18
day, and I was at that level for almost my entire 12:29:22
smoking history. Probably within the first six to 12:29:26
eight months, I think is what I said earlier, I was 12:29:28
a heavy smoker and that continued right along except 12:29:30
for the time I smoked a pipe. 12:29:32

Q. Have you had any experience with Medicaid patients 12:30:16
in Minnesota? 12:30:16

A. I see all kinds of patients. Yeah, I have had 12:30:22

experience with Medicaid, Medicare, I have had 12:30:24
experience with a lot of patients in my medical 12:30:28
practice as well as in the nicotine center. 12:30:28

Q. How much experience have you had with helping people 12:30:36
who you understood to be Medicaid recipients in 12:30:38
Minnesota quit smoking? 12:30:40

A. I don't know. I mean, I don't keep track -- what we 12:30:48
try to do at Mayo Clinic is not to identify the 12:30:50
origin of payment of the individual. We want the 12:30:54

patients to be treated the same whether or not they have any money, so we try not to -- we try not to put that into the equation for the practicing physician. Business office deals with all that stuff. I have enough trouble with just keeping track of what I do. 12:30:56 12:31:02 12:31:02 12:31:06 12:31:08 12:31:10

Q. So as a general rule you probably wouldn't know which of your patients were Medicaid recipients and which weren't? 12:31:12 12:31:16 12:31:16

A. As a general rule, that's correct. I mean, if they told me I would know, but I wouldn't -- there is no way for me to really identify them, necessarily. 12:31:20 12:31:24 12:31:30

And the reason is because, as I say, we want the patients to get the right treatment regardless of their payment capabilities. 12:31:32 12:31:34 12:31:36

Q. Is the title of the center at the Mayo Clinic The 12:31:44

Nicotine Dependence Center? 12:31:46

A. That is the title of the -- of our center, yep. 12:31:50

Q. Do you know why the term "dependence" was picked for the title rather than the term "addiction"? 12:31:56 12:31:56

A. Yeah, it's an interesting story, actually, it feeds into what we talked about earlier as far as people trying to decide these things and the synonymous nature of the definitions. 12:32:00 12:32:02 12:32:08 12:32:08

When we started the program it was called The Smoking Cessation Program, back in '88. And within a couple of years we realized that that was too narrow because we were seeing people with other 12:32:10 12:32:14 12:32:16 12:32:18

forms of nicotine dependence. We talked about 12:32:22
nicotine dependence and nicotine addiction in the 12:32:24
early stages. But decided to call it The Smoking 12:32:28
Cessation Clinic because the old clinic was the 12:32:30
Smokers' Clinic, kind of how it evolved. 12:32:32
So we had an internal discussion amongst 12:32:34
the staff to change the name from Smoking Cessation 12:32:38
to something to do with nicotine, whether it be 12:32:40
addiction or dependence was the choice. 12:32:44
And so we had the same discussion I am 12:32:46
sure Tracy Orleans and John Slade did when they 12:32:48
talked about the textbook, and I am sure that the 12:32:50
Surgeon General did about the '88 Report, whether to 12:33:08

call it nicotine addiction or nicotine dependence. 12:33:08
And in the '88 Surgeon's General Report it was
called nicotine addiction.
We talked about it amongst the staff and 12:33:10
we viewed those two terms as being synonymous, and 12:33:16
the staff sense was that they would prefer to use 12:33:20
dependence. 12:33:20
Some wanted addiction, some wanted 12:33:22
dependence. It just -- it wasn't -- well, it may 12:33:26
have been a democratic, I can't remember. We 12:33:28
decided as a group what to call it. 12:33:30
Q. Did you have a view on which it ought to be called? 12:33:32
A. Probably. It's hard to recall all those 12:33:38
conversations. I think that -- I think dependence 12:33:44

was the word that I preferred, but it was a close call. The final analysis was that it would have been fine either way. 12:33:48 12:33:52 12:33:54

Q. And to the extent that -- 12:33:56

A. We are not going to change it, we have gotten kind to -- we have adopted that now, we are going to stay with that. I don't think anyone is anxious to change -- name changes are hard and that one was hard enough. 12:33:58 12:34:02 12:34:04 12:34:08 12:34:08

Q. To the extent your recollection is you preferred dependence, what's your recollection as to why that 12:34:10 12:34:14

was your preference? 12:34:14

A. I really -- I really don't know. We discussed all the different aspects of this, labeling a variety of different aspects of it, and, you know, tried to do it from the perspective of the patient. 12:34:16 12:34:22 12:34:28 12:34:30

And we couldn't get a fix, it was a long discussion. It took us several staff meetings to come to that conclusion. So it wasn't just an automatic it's this way or that way. 12:34:34 12:34:38 12:34:42 12:34:44

We talked about all those different factors, which would be more acceptable to patients, which would be more understood by the referring physician, and so on. 12:34:44 12:34:48 12:34:50 12:34:50

And we concluded that both of them would be understood and could be used, and then just decided to use dependence. I can't be more -- because I don't recall if I had some driving reason 12:34:52 12:34:54 12:35:00 12:35:08

to do one or the other. I just can't remember. 12:35:10

Q. Is it fair to say that addiction is generally 12:35:14
regarded as a term with more pejoratives attached to 12:35:18
it than the term dependence has? 12:35:22

MS. WALBURN: Objection, form. 12:35:24

THE WITNESS: It depends on the eyes of 12:35:26
the beholder, I guess, who would have -- you know, 12:35:28
who would say one thing was pejorative or another. 12:35:32

Some patients actually prefer the term 12:35:34
addiction, whereas others haven't thought about it 12:35:36
very much. 12:35:38

The same discussion went -- took place at 12:35:40
our alcoholism and drug dependence unit which used 12:35:44
to be the called the Alcoholism Treatment Unit which 12:35:48
is now called the Inpatient Addictions Program. Go 12:35:52
figure. I can't figure. 12:35:54

So that's evolved over time and those 12:35:54
people did the same thing we did, decided what to 12:35:58
call it based on what the staff wanted to do. 12:36:00

So it went from dependence, you know, 18 12:36:04
years ago to Inpatient Addictions Program 12:36:06
presently. 12:36:08

So I -- and that has to do with 12:36:10
addictions, alcohol and other drugs, not to nicotine 12:36:14
addiction, but they went through the same process we 12:36:16
did. 12:36:16

So I don't -- it depends on the eyes of 12:36:22

the beholder as far as pejorative or not. 12:36:24

MR. NIMS: This is probably a pretty good 12:36:28
spot to break for lunch. 12:36:32

THE WITNESS: Sounds good to me.

VIDEOGRAPHER: We are temporarily going 12:36:34
off the record. The time is now 12:36 p.m. 12:36:40

(Whereupon, the noon recess was taken.) 13:16:10

VIDEOGRAPHER: We are back on the video 13:16:38
record. The time is now 1:16 p.m. 13:16:44

BY MR. NIMS:

Q. Dr. Hurt, do you believe that every smoker who 13:16:52
decides that he or she wishes to quit smoking is 13:16:56
responsible for doing whatever it takes to get that 13:17:00
done? 13:17:00

MS. WALBURN: Objection, form. 13:17:02

THE WITNESS: "Every" is probably too many 13:17:06
to even begin to think about in the context of your 13:17:10
question. I mean, I -- it needs to be more specific 13:17:12
than that. 13:17:14

BY MR. NIMS:

Q. Well, are there some set of smokers that you don't 13:17:20
believe are responsible for doing whatever it takes 13:17:22
to stop smoking if they have decided that's what 13:17:26
they want to do? 13:17:28

A. Well, there is not a simple answer to that. You 13:17:30
have to understand the addictive process and that 13:17:32
some smokers have higher degrees of dependence. 13:17:36

So "responsibility" is the word I am kind 13:17:38

of getting hung up on because I don't know that it's the right word and maybe you want to think about a different one because I don't -- though the person

may start smoking for one reason or another, when they become dependent, then they lose control.

So an addictive process is the loss of control. And if people could regain control by being responsible, that would be one thing, but I -- it's -- so it's loss of control that enters into this that makes it so they can't stop.

So I am not -- that doesn't answer your question but the "responsible for" is -- I don't know exactly what that means.

Q. How do you determine which set of smokers simply can't stop?

A. I don't think there is a set that simply can't stop. I mean, the example I gave you earlier about the guy that finally stopped, but after he developed lung cancer, was able to stop but it took a long time. Stopping smoking is a process, so I don't know that there is a group that I'd say can't stop.

There are obviously some that are more difficult to treat than others, and some end up dying of their tobacco-related disease before they are able to stop with other methods.

So I -- when a patient is in front of you, you want to try to help them, and if they are a

smoker, you want to try to help them stop smoking. 13:19:14

Q. Have you ever had anybody go through the program at the Mayo Clinic and either at the end of that program or thereafter relapse who came back to you and you told them, "I just don't think you can do it, you are wasting your time and my time"? 13:19:16 13:19:18 13:19:22 13:19:26 13:19:30

A. I don't recall ever saying anything like that to any patient. What we try to do is to figure out different options for them to use, just like we are treating any other medical condition. 13:19:34 13:19:38 13:19:42 13:19:44

I mean, it's -- just because a person's blood pressure isn't under control with one or two or three different medicines doesn't mean we should say, "You are stuck with it." We try to continue to work with them to fix whatever the problem is. 13:19:46 13:19:50 13:19:52 13:19:54 13:19:56

Q. You indicated a moment ago in your answer that some people are more dependent than others. 13:20:00 13:20:02

How do you measure that? 13:20:04

A. Well, there is one way that's used to measure that that's kind of accepted in the scientific world of addictions, and that's the Fagerstrom Test or the Fagerstrom Tolerance Score. That's one way of doing it. 13:20:08 13:20:12 13:20:14 13:20:20 13:20:20

Q. There are deficiencies in that test, are there not? 13:20:24

A. I think there are deficiencies in all tests. I mean, even CBC's have deficiencies. So in that 13:20:28 13:20:32

respect there would be deficiencies in this. 13:20:36

It is a -- probably the most widely used 13:20:40
smoking questionnaire in the world to measure 13:20:44
dependence or addiction. 13:20:46

Q. When people come to your clinic does the score that 13:20:56
they get on the Fagerstrom Test determine how you go 13:21:02
about helping them? 13:21:02

A. It's one of the factors that we look at, and in some 13:21:10
of the parts of the score it may have more influence 13:21:16
on what types of things we might do. 13:21:18

For example, in the newer version, the 13:21:20
Fagerstrom Test for nicotine dependence, they 13:21:24
modified it so that it has different time intervals 13:21:28
to the time in the morning you start smoking. 13:21:32

And so the sooner a person starts smoking 13:21:36
in the morning after arising is a measure of more 13:21:40
severe dependence. That's one of the questions out 13:21:44
of that questionnaire that's used. 13:21:46

So to answer your question, the score, 13:21:50
itself, is sometimes used but some of the items are 13:21:52
also used, and that's just in the context of the 13:21:54
overall assessment of the patient. 13:21:58

Q. Do you use nicotine replacement therapy on everybody 13:22:02
who enters the program? 13:22:04

A. Well, as I think we talked earlier, I don't keep 13:22:08

track of that, and we've not gone back to see how many had nicotine replacement therapy. And now it's becoming more complicated because we have Bupropion, which is a dopaminergic antidepressant that has been proven to be successful in treating nicotine addiction. 13:22:16 13:22:18 13:22:22 13:22:26 13:22:30 13:22:30

So it's no longer just nicotine replacement therapy, I would say the vast majority of people have some pharmacologic adjunct. And it's also harder to keep track now because of nicotine patches and nicotine gum are over the counter, so people can do that without seeing the physician. 13:22:32 13:22:34 13:22:40 13:22:44 13:22:48 13:22:50

Q. Do you use some form of behavior modification therapy with everybody? 13:22:54 13:22:56

A. I think as I outlined in my report, there are four principles that we use for the treatment of these patients and that's kind of the underpinning of the entire program, their behavioral treatment, addictions treatment, pharmacologic treatment and relapse prevention. 13:23:00 13:23:02 13:23:04 13:23:06 13:23:12 13:23:14

Those are the philosophical underpinnings of the program, and so they would be something that we and the counselors would apply to every patient in varying degrees. Some may need more of one than the other. 13:23:20 13:23:20 13:23:22 13:23:24 13:23:24

Q. And those four underpinnings would be used in whatever combination you deem appropriate irrespective of what the score on the Fagerstrom 13:23:32 13:23:36 13:23:40

Questionnaire may have been; is that true? 13:23:42

A. Well, the Fagerstrom Questionnaire would be one of the factors used in the assessments. The philosophical underpinnings are kind of the treatment -- the treatment part. 13:23:46 13:23:48 13:23:50 13:23:50

And so the assessment would be based on -- the Fagerstrom questions would be one, whether or not the person had a severe medical problem related to their smoking would be another, their previous attempts to stop, what happened to them when they made the previous attempts, how long they had been off cigarettes before. 13:23:52 13:23:56 13:23:58 13:24:02 13:24:06 13:24:08 13:24:10

And so there is a whole range of things that are used to go into the treatment planning, if you will. 13:24:10 13:24:14 13:24:14

Q. Do you explore with them when they arrive their motivation for wanting to quit? 13:24:18 13:24:20

A. Well, motivation is something we talk a lot about and assess but we assess it in the terms of their stages of change or stages of readiness. And that's the most recent way of assessing kind of where they are on the stage of stopping. 13:24:24 13:24:30 13:24:32 13:24:38 13:24:40

So as we talked earlier, motivation can be, you know, really kind of in your face with "I just had a heart attack," and that's a high motivator for some people. 13:24:42 13:24:46 13:24:48 13:24:50

And that might move them from where they 13:24:52

never thought about stopping before, as a precontemplator to action, where they actually stop. 13:24:54 13:24:58 13:24:58

So we assess their stage of readiness or their stage of change, which is kind of an assessment of their motivation. 13:25:02 13:25:04 13:25:06

Q. I mean, true motivation to quit is critical to the program being successful, isn't it? 13:25:10 13:25:12

A. Well, motivation, as we have just discussed, is a part of that and it can come about for a variety of different -- different ways. 13:25:18 13:25:20 13:25:20

Q. But however it comes about, it's critical that it be present if you are going to succeed, isn't that fair? 13:25:24 13:25:28 13:25:28

A. "Critical" may be too strong a word. 13:25:32

It's an important ingredient. We have people who, as patients, who weren't particularly motivated until something bad happened to them which brought this right to them, and as a result of that plus the counseling we might give to them in the 13:25:36 13:25:40 13:25:44 13:25:48 13:25:50

face of this bad medical complication, then we can help them become more motivated, if you will. 13:25:54 13:25:58

Q. In looking through your publications, Doctor, it appeared that some of your studies have been financed by drug companies who are marketing nicotine replacement products? 13:26:10 13:26:14 13:26:20 13:26:22

A. That's correct. 13:26:24

Q. How much funding have you received generally from 13:26:28

drug companies marketing those products? 13:26:32

A. Varies from year to year. And what we do, just so you understand, we develop questions, scientific questions, that are of interest to us as well as of interest to a company with a product and then together we develop a protocol to study that issue, whatever the issue is. 13:26:40 13:26:46 13:26:48 13:26:52 13:26:54

We do not just kind of have a drug company call us up and say, "We have got a protocol to test this, that and the other, will your center just run this?" We don't do that. 13:26:56 13:27:00 13:27:04 13:27:04

There is only three reasons we do the research, and one is to advance the science, to publish those results, and to maintain our really highly skilled staff. And so we are not interested in just kind of doing off-the-shelf protocols from drug companies. 13:27:06 13:27:08 13:27:12 13:27:14 13:27:16 13:27:18

So we are collaborators in the sense that we work with them to develop the scientific questions and work out how to answer those, which comes out to be mutually beneficial. 13:27:20 13:27:22 13:27:26 13:27:28

So from one year to the next it may vary. Some years it may be a hundred thousand dollars of extramurally funded research from companies, other years it may be several hundred thousand dollars. It will just vary from year to year. 13:27:32 13:27:36 13:27:40 13:27:42 13:27:44

Q. But at least since you have been at the Mayo 13:27:52

Nicotine Dependence Center you have regularly received funding from such drug companies? 13:27:52 13:27:54

MS. WALBURN: I am going to object to the form and specifically, the word "you" as being vague. 13:27:56 13:27:58 13:28:00

BY MR. NIMS:

Q. The -- well, I use "you," I guess, advisedly in your work. 13:28:04 13:28:06

A. As one of the investigators, and in the more global sense, the Nicotine Research Center, yeah, we have had support from drug companies. We have also had support from our own internal Mayo Research Committee. 13:28:08 13:28:10 13:28:14 13:28:16 13:28:18

Mayo funds a very large amount of its own research, probably to the tune of 60 million 13:28:22 13:28:26

dollars, and that, again, is -- that much again is funded from extramural sources. 13:28:28 13:28:30

Extramural sources include drug companies as well as the National Institute of Health. We have had funding from NIH, as well. 13:28:34 13:28:36 13:28:38

Q. So is it fair to say that you believe it's appropriate for a company with a financial interest in the product to nonetheless fund research through an outside institution such as the Mayo Clinic? 13:28:44 13:28:48 13:28:52 13:28:54

A. We are governed by very strict rules when it comes to our relationships with industry. There is a whole committee called the Medical Industry Relations Committee which overseas those 13:29:02 13:29:08 13:29:10 13:29:10

relationships, and if there is an appearance of a conflict, then we are not allowed to engage in those sorts of relationships. 13:29:12 13:29:16 13:29:18

All the contracts are done through our legal section and so it's a very, very tightly controlled -- from an investigator's standpoint, it's the best way to do it because we know when we do it this way that we are all doing it for the science and not for some other reason. 13:29:20 13:29:26 13:29:30 13:29:32 13:29:36 13:29:38

Q. Do you believe that there is a known quantity of nicotine in a cigarette that is below the threshold at which nicotine is addictive? 13:29:52 13:29:58 13:30:00

A. I think there is, and I think it's just yet to be defined. One of the documents I reviewed defines what's considered to be a threshold but it's done in the other sense, it's done in this is the threshold we have to make sure we have in order for it to be addicting, which is a little different than the way I would look about it. I would want to know the threshold below which the delivery of nicotine would be non-addicting and use it in that sense. 13:30:06 13:30:10 13:30:16 13:30:20 13:30:22 13:30:26 13:30:28 13:30:32 13:30:36

There is -- there is a threshold. I don't know exactly what it is. It's -- but it's something that the documents talk about as well as some of the things that are published in the more recent scientific literature talk about. 13:30:38 13:30:40 13:30:44 13:30:46 13:30:48

Q. Do you believe that scientists generally believe 13:30:52

they know what that threshold is? 13:30:54

MS. WALBURN: Objection, form, calls for speculation. 13:30:56 13:30:58

THE WITNESS: Well, I don't know which scientists you are talking about and, you know, there have been some publications in the literature about this, but I would have to literally see them in order to be able to talk very much about them. 13:31:00 13:31:02 13:31:04 13:31:10 13:31:14

BY MR. NIMS:

Q. You -- were you done? 13:31:14

A. No, I was just going to say I know there is at least one document I think cited in the expert report that has a threshold level that's talked about with regard to what one of the companies thought was an important threshold. 13:31:18 13:31:20 13:31:22 13:31:26 13:31:28

And I should add that we are talking about the amount of nicotine that the organism actually takes in. I think we address that a little bit in the expert report, that the FTC method is one that is -- gives what happens to smoking machines, but people don't smoke like that. 13:31:32 13:31:36 13:31:40 13:31:44 13:31:46 13:31:50

So if you are talking about the absolute levels of nicotine in a cigarette being below a certain level, it would be just that, it wouldn't be some kind of smoke and mirrors sort of approach to put vent holes and dilute the smoke and so on, so that it comes out in a smoking machine as being lower but in reality, in smokers who compensate, 13:31:50 13:31:52 13:31:56 13:31:58 13:32:02 13:32:04 13:32:06

they actually get the same levels, if not more levels, of nicotine and tar. 13:32:10 13:32:12

Q. Do you believe that there is a better method than the FTC method which should be used? 13:32:14 13:32:18

MS. WALBURN: Objection, form. 13:32:20

THE WITNESS: Well, the FTC method has been the methodology that's been used for all these 13:32:22 13:32:26

years, and there probably are better ways of doing that. But the point is, is not how it's measured, it's actually how much nicotine is contained in the cigarette. 13:32:28 13:32:34 13:32:36 13:32:36

If there is only a certain amount contained in this cigarette -- and this is what you are talking about, the threshold level -- if there is only a certain amount in the cigarette, there is a threshold below which the cigarette would not be as addicting as a cigarette with a higher level. 13:32:38 13:32:40 13:32:42 13:32:44 13:32:48 13:32:52

So regardless of what method is used to measure it, we are talking rather than the measure what the output is from perhaps the amount of nicotine -- we are talking about the absolute level of nicotine in the cigarette, itself. And that's what's important. 13:32:56 13:33:06 13:33:06 13:33:06 13:33:10 13:33:14

BY MR. NIMS:

Q. I believe you were part of the FDA subcommittee hearings back in 1994 which were exploring the issue of whether there was a threshold. 13:33:20 13:33:24 13:33:26

21 A. I think we mentioned in the report. I was a person 13:33:32
22 that made a presentation at the FDA hearings. It 13:33:36
23 was in -- did you say '94? 13:33:38
24 Q. That's what I said. I think that's what it was. 13:33:40
25 A. I think it was in the summer of '94, and it's in 13:33:44

1 here somewhere, but I made two presentations to the 13:33:46
2 FDA advisory committee on abuse or drug abuse. 13:33:52
3 Q. And do you know whether or not that committee 13:33:54
4 concluded that they knew the threshold or concluded 13:33:58
5 that they didn't? 13:34:00
6 A. I don't know that that was one of their charges. As 13:34:02
7 I remember, the first day of those hearings was to 13:34:04
8 look at a nicotine nasal spray as a new device to 13:34:12
9 help people stop smoking. 13:34:14
10 And the second day was to consider 13:34:16
11 nicotine as an addicting substance. And I made a 13:34:20
12 presentation the first day and the second day but I 13:34:24
13 don't recall threshold as being a charge of 13:34:28
14 the group. It could have been, but I don't remember 13:34:30
15 that. 13:34:30
16 Q. Are you familiar with the studies that have explored 13:34:52
17 self-efficacy measures as a predictor of smoking 13:34:58
18 cessation's success? 13:35:02
19 A. Well, there is a -- you know, there is lots of 13:35:04
20 studies on lots of different things. There have 13:35:08
21 been studies on self-efficacy. 13:35:12
22 I can't tell you which ones you are 13:35:12
23 talking about because you haven't told me. I am 13:35:16

familiar with the broad issue, I have read about self-efficacy. But as far as specific studies, you would have to show them to me so we could talk about what -- what -- which ones we are talking about.

Q. Do you believe that self-efficacy is a more reliable predictor of smoking cessation success than other measures that have been tried?

A. Oh, again, we are talking about a process of stopping smoking, and motivations, we have already mentioned, is important, degree of dependence is important, self-efficacy is important, stage of change is important. I mean, all those things is important.

I don't know that -- even in a group of people I am not sure we could say one was necessarily more important than another, and it depends on the study that was done, what study, what the subjects were and so on.

It's important.

Q. Do you -- when people come to the Mayo Nicotine Dependence Center, do you do any measure of self-efficacy?

A. We do an assessment but not a, quote, "measure." We don't do a test. Again, this is given in -- the clinical program we have only limited time with the patient so we really gear up to get into the issue, and the issue is their degree of dependence and how

severely dependent they are, and try to develop a treatment plan around that, as well as a lot of other things. 13:36:40 13:36:42 13:36:44

So we don't -- we have a questionnaire that we use to gather information, which has some self-efficacy components to it but is not a, quote, "self-efficacy questionnaire." 13:36:46 13:36:50 13:36:54 13:36:56

If we gave the MMPI and a self-efficacy questionnaire, and so on and so on, we would not have any time to intervene with the patient. So it's just a matter of the practical aspects of the clinical program. 13:37:00 13:37:04 13:37:06 13:37:08 13:37:10

Q. Have you ever gone back to see how self-efficacy correlates with success in your own patients at the Mayo Clinic? 13:37:12 13:37:16 13:37:18

A. I don't recall that we have ever done that. And again, retrospective studies are fraught with all kinds of difficulties, and we have done some retrospective studies looking at various things. 13:37:22 13:37:24 13:37:28 13:37:32

They are hard to do and they are hard to publish because you are -- just because of the difficulty doing retro -- much better to do a prospective randomized trial than a looking back sort of a thing. 13:37:36 13:37:38 13:37:42 13:37:44 13:37:46

Q. If I could direct your attention to page 16 of your 13:38:26

report. 13:38:28

A. Okay. 13:38:28

Q. In about the middle of page 16 you write a paragraph making reference to an R.J. Reynolds document. 13:38:50 13:38:54

A. Uh-huh. 13:38:56

Q. Did you find anything significant about that document other than what you wrote in your report? 13:38:58 13:39:02

A. Well, you know -- 13:39:04

MS. WALBURN: Objection, form. 13:39:06

THE WITNESS: This is just an example of a quote from the article and so it's not the whole article, the whole article is obviously much longer than that. 13:39:10 13:39:12 13:39:16 13:39:16

So actually, throughout the report -- I think we talked about this before -- as far as the documents that are cited, there are just the ones that seem to fit in with the report, and this is just an example of some of the things that I have reviewed as far as the documents. 13:39:18 13:39:20 13:39:24 13:39:26 13:39:28 13:39:30

It's not all the documents and it's not all the content of the documents, these are just parts of them. 13:39:34 13:39:36 13:39:38

BY MR. NIMS:

Q. I understand. But like I say, what I said before, this is my only chance to ask what you think and why you think it. 13:39:40 13:39:44 13:39:44

A. Okay. 13:39:46
Q. You know, if you could find the document to which you made reference there, 500915683. 13:39:48 13:39:56
A. Correct. 13:39:56
Q. Is there anything else in that document that you believe to be significant? 13:40:00 13:40:00
MS. WALBURN: Objection, asked and answered and form. 13:40:04 13:40:04
THE WITNESS: You know, you could read the whole document, I guess. This is just one statement out of the document which speaks to the -- kind of the theme that we see in the rest of it as far as talking about pharmacologic -- pharmaceutical industry, delivery of nicotine, a potent drug with a variety of physiological effects. 13:40:10 13:40:14 13:40:18 13:40:20 13:40:26 13:40:32 13:40:36
So that's kind of what the company knew and when they knew it, and that's just one example. I mean, there is -- it's hard -- there is so many of them it's hard to pick them all out. 13:40:38 13:40:42 13:40:46 13:40:48
I mean, just for example, if you want another example, "If nicotine is the sine qua non" -- next page -- "of tobacco products and tobacco products are recognized as being attractive dosage forms of nicotine, then it is logical to 13:40:50 13:40:54 13:40:56 13:41:00 13:41:04

design our products and, where possible, our advertising around nicotine delivery rather than tar delivery of flavor." 13:41:06 13:41:12 13:41:14
I mean, we are talking about a drug and 13:41:16

that's what they are talking about here and that's what they are talking about on the page before. 13:41:18 13:41:20

Further on in that -- the first quote comes from the -- as far as the one that's in the expert report, about the industry may be thought of as being a specialized, highly ritualized and stylized segment of the pharmaceutical industry. 13:41:22 13:41:24 13:41:28 13:41:34 13:41:38

And then going down a little bit further, it talks about physiological satisfaction derived from nicotine, his choice of -- "the choice of product and pattern of usage are primarily determined by his individual nicotine dosage requirements, and secondarily, by a variety of other considerations, including flavor and irritancy of the product," and so on. 13:41:40 13:41:44 13:42:00 13:42:06 13:42:08 13:42:12 13:42:16 13:42:16

This author is talking about a drug delivery system and the drug is nicotine, and the delivery system in this instance comes from R.J. Reynolds and it's -- that's just what the document says. 13:42:22 13:42:28 13:42:30 13:42:36 13:42:38

So, thus, a tobacco product is, in 13:42:42

essence, a vehicle for delivery of nicotine designed to deliver the nicotine in a generally acceptable and attractive form. 13:42:48 13:42:50 13:42:52

"Our industry is then based upon design, manufacture and sale of attractive dosage forms of nicotine. And our company's position in our 13:42:54 13:42:58 13:43:04

industry is determined by our ability to produce dosage forms of nicotine which have more overall value, tangible or intangible, to the consumer than those of our competitors." 13:43:08 13:43:12 13:43:18 13:43:18

And we are -- I mean, I don't know how much plainer it has to be. We are talking about a drug delivery system delivering nicotine, a potent drug. 13:43:20 13:43:22 13:43:26 13:43:26

So that's kind of -- we could have put all that in there but it would take up a lot of space. That's actually just the paragraph underneath the one that's right above it, so -- 13:43:28 13:43:32 13:43:34 13:43:36

BY MR. NIMS:

Q. Do you know who within R.J. Reynolds received the document? 13:43:40 13:43:40

A. No, I do not know that. 13:43:44

Q. Do you know what was -- 13:43:44

A. It was written by a man by the name of Claude -- I assume he is a man -- Claude E. Teague, written on 13:43:48 13:43:52

April 14th, 1972, which is, you know, 26 -- 5 years ago. I don't know who he is. Who was he? 13:43:58 13:44:00

Q. Do you know what was done with the document by anybody who received it? 13:44:04 13:44:06

A. I don't know. Nobody. It's -- the title of it is "Research Planning Memorandum on the Nature of the Tobacco Business and the Crucial Role of Nicotine Therein." 13:44:12 13:44:14 13:44:18 13:44:18

If I were to have a document like this at 13:44:22

the Mayo Clinic, "the Research Planning Memorandum on the Nature of Medicine as it's Practiced at the Mayo Clinic and the Crucial Role of X, Y or Z Therein," my assumption would be that people at a very high level of the organization would see such a document. 13:44:26 13:44:30 13:44:34 13:44:38 13:44:40 13:44:40

Q. And if you wrote that, would you say that that represented the position of the Mayo Clinic? 13:44:46 13:44:48

A. If it were circulated to people that were at those levels of the decision-making, which I don't know if this was or not. If it were endorsed or incorporated into those decision-making processes, it could become that, correct. 13:44:52 13:44:56 13:44:58 13:45:02 13:45:04

Q. So what you write you wouldn't automatically say represents the position of the Mayo Clinic? 13:45:08 13:45:10

MS. WALBURN: Objection, form. 13:45:12

THE WITNESS: In this context it depends upon who this person was and who he reported to. I mean, if he is a janitor I guess it wouldn't make any sense that he would be doing much of anything. 13:45:14 13:45:18 13:45:20 13:45:24

But if he were an important individual in our place, if this came from a vice-president level person or above, that would be pretty important. 13:45:26 13:45:30 13:45:34

BY MR. NIMS:

Q. If I can refocus you on my question about you, you are obviously not a janitor, you have a position of responsibility at the Mayo Clinic. I take it you 13:45:40 13:45:44 13:45:46

would agree you have such a position? 13:45:48

A. I do. 13:45:48

Q. But if you wrote a document stating your opinion about something, you would not regard that to be the opinion of the Mayo Clinic just because you are a responsible person of the Mayo -- employed by the Mayo Clinic, would you? 13:45:52 13:45:56 13:45:58 13:46:02 13:46:04

MS. WALBURN: Well, objection, form and asked and answered. 13:46:06 13:46:06

THE WITNESS: If this were to be my document, change all the words and make it into some medical thing, and I were to forward that on to the administrative committee of our board and then it went on to the Board of Governors, I would be part 13:46:10 13:46:12 13:46:14 13:46:18 13:46:20

of the process of influencing Mayo Clinic policy. Whether or not it would be approved would be a different issue. 13:46:22 13:46:26 13:46:26

But that would be -- that's part of the process of doing that. And that's how -- that's how changes occur. 13:46:28 13:46:32 13:46:34

At least at our place, just so you understand, at our place probably even the CEO doesn't set all policy. It's a very -- I think I come from a little bit different world than the tobacco industry, where our organization is very horizontal in its orientation, and the decisions are made by consensus and collectively, not by individuals. 13:46:40 13:46:42 13:46:46 13:46:50 13:46:52 13:46:56 13:47:00 13:47:02

So I think that's probably a little different than what happens with these folks but I don't know that. Maybe they did it the same way. 13:47:08 13:47:12 13:48:02

It's amazing what you don't see the first time you read these things. 13:48:04 13:48:30

BY MR. NIMS:

Q. If I could direct your attention to page 17 of your report. 13:48:32 13:48:36

A. Okay.

Q. Down at the bottom you make reference to another R.J. Reynolds document. If you could find that in your -- 13:48:40 13:48:46

A. Okay.

Q. -- volume, there. 13:48:46

A. Got it. 13:48:50

Q. Do you know who the author of this document was? 13:48:54

A. Well, let's see. Sometimes they put them at the end and sometimes they don't. 13:49:02 13:49:20

No, there is no notation on here on who -- there is no cover sheet and there is no end sheet that has a signature. 13:49:22 13:49:26 13:49:26

Q. Do you know when the document was written? 13:49:32

A. No. It obviously was sometime in the -- well, I don't know. I would have to go through the whole thing to see if there is a date that jumps out or something. I do not know. I don't see any dates in there, at least on a scan of it. 13:49:52 13:49:56 13:50:00 13:50:10 13:50:12

Interesting-looking device, though. 13:50:28

Q. If I could direct your attention to page 18 of your report. 13:51:06

A. Okay. 13:51:10

Q. You make reference to an R.J.R. document there in the middle. 13:51:12

A. Uh-huh. 13:51:16

Q. Do you believe that it was a desirable objective for a tobacco company to be seeking to reduce tar levels? 13:51:22

MS. WALBURN: Well, objection, form. 13:51:26

THE WITNESS: I haven't gotten to it yet, so -- so which one are you talking about? I think I am on the wrong one. 13:51:30

BY MR. NIMS:

Q. The 50088 -- 13:51:52

A. 7542? 13:51:54

Q. Right. 13:51:54

A. So it has to do with "additives compatible with smoker satisfaction and profitability"? Is that what -- is that the quote? 13:51:58

Q. Yes, that's the quote. 13:52:04

A. Well, it's -- so what's the question? 13:52:12

Q. Well, you indicate in your paragraph there that the document discusses "how nicotine levels could be maintained or increased as tar levels were reduced." 13:52:16

A. Uh-huh. 13:52:22

Q. My question is, do you believe it was a desirable objective for a tobacco company to be pursuing the reduction in tar levels? 13:52:26 13:52:28 13:52:30

MS. WALBURN: Objection, form. 13:52:32

THE WITNESS: Well, the problem with that is that, as I think it's stated in one of the other 13:52:36 13:52:40

documents, and I can't tell you which one, is that reducing the nicotine, though you may also reduce the tar, sometimes the -- when the person compensates for the lower nicotine delivery by smoking harder, as a word, or inhaling deeper, holding your breath longer, actually might deliver more tar levels. 13:52:42 13:52:46 13:52:48 13:52:52 13:53:00 13:53:04 13:53:04

So if your question is would it be desirable for them to make a safer cigarette, I think that would be appropriate, but I don't think that's what actually happened because I -- really, I don't think there is such a thing as a safer cigarette. 13:53:06 13:53:10 13:53:12 13:53:16 13:53:18 13:54:42

BY MR. NIMS:

Q. If I could direct your attention to page 19 of your report. 13:54:46 13:54:46

A. Okay. 13:54:48

Q. You make reference to an R.J. Reynolds document at the bottom of that page. 13:55:00 13:55:00

A. Yeah, the 5042, et cetera? 13:55:04

Q. Yes. 13:55:04

22 A. Okay. 13:55:06
23 Q. Do you know whether or not R.J. Reynolds pursued the 13:55:30
24 possible project number 4 that you have made 13:55:34
25 reference to in your quote? 13:55:36

1 A. You mean the one that says "Habituating Level of 13:55:42
2 Nicotine (How Low Can We Go?)" That one? 13:55:52
3 Q. That's the one you have quoted, yes. The document 13:55:54
4 says, "The following are suggested as possible IBT 13:55:58
5 undertakings." 13:56:00
6 A. Uh-huh.
7 Q. My question is, do you know whether anything was 13:56:02
8 done to pursue number 4 as a possible project? 13:56:06
9 A. Well, let me just think a second. In the industry 13:56:44
10 there was that effort as evidenced by documents from 13:56:46
11 other companies. 13:56:48
12 Q. I am only asking about Reynolds. 13:56:50
13 A. Well, it's pretty hard to separate out Reynolds from 13:56:54
14 the rest of this group. I mean -- 13:56:56
15 Q. Not for me. 13:56:56
16 A. Not for you, but for me as a former consumer of your 13:57:00
17 products, and also one that's trying to help people 13:57:02
18 to stop using it, you kind of all get lumped 13:57:04
19 together. You know, you are all kind of bedfellows 13:57:08
20 in this. 13:57:08
21 And so in the sense of other companies 13:57:10
22 doing this, we know that they were doing it because 13:57:14
23 of what they said in the internal documents. 13:57:16
24 And rather than phrase the question, "Do I 13:57:18

know if they did it or not," I would assume that they did because I think there was interest in establishing the threshold level of the addicting nature of nicotine or the threshold level for the addiction to nicotine. 13:57:20 13:57:22 13:57:26 13:57:30 13:57:32

So my assumption would be in the absence of a document saying to the contrary, yeah, they probably pursued this, but if you asked me if I know for certain, I don't know for certain. 13:57:32 13:57:36 13:57:38 13:57:58

I guess -- I guess I am not sure of the dates. What was the date on that one? 13:58:00 13:58:02

Q. May of 1971. 13:58:06

A. On page 50091 it talks about, "reduction or elimination of nicotine from our products. Then we shall eventually liquidate our business." 13:58:28 13:58:32 13:58:34

So whatever the date of that document is, which is the one we just talked about, which I -- I think that came from a guy by the name of Teague, and that was -- I have got that right, is that right? Teague, April of 1972. 13:58:38 13:58:42 13:58:46 13:58:50 13:58:54

At least this man had interest in the level. "If, as proposed above, nicotine is the sine qua non of smoking and if we meekly accept the allegation of our critics and move toward reduction or elimination of nicotine from our products, then we shall eventually liquidate our business. If we 13:58:56 13:59:04 13:59:08 13:59:22 13:59:26 13:59:30

intend to remain in business and our business is the manufacture and sale of dosage forms of nicotine, then at some point we must make them make a stand." 13:59:34 13:59:36 13:59:40

And then they go on to talk about later on in this document the levels, the threshold levels that are needed to do that. 13:59:42 13:59:44 13:59:46

And that's -- and so in the context of your question, "Did they go ahead and do something after 1971," I don't know, but that's at least one document that says that they might have and there is more. 13:59:58 14:00:00 14:00:02 14:00:02 14:00:04

I don't know if they are related to your company or not but the industry -- this actually is from R.J. Reynolds but it was beforehand, before that. So this is from William Dunn. I don't have a date on this one. But it talks about the nicotine levels and so on as being important. 14:00:04 14:00:06 14:00:06 14:00:12 14:00:20 14:00:22

And then there is only one more that I at least keyed, and see if it's from your company. But that's really -- to me it's irrelevant, because all of you are together. 14:00:26 14:00:30 14:00:34 14:00:36

And this also comes from R.J. Reynolds, and that's actually the one I just read to you which is about needing to make -- "make sure that we have effects and satisfying effects derived from the use 14:00:38 14:00:40 14:00:44 14:00:50

of nicotine." 14:00:50

So I don't know if it did, but I would say 14:00:52

that that would speak to the fact that someone was 14:00:56

still concerned about a threshold dose effect. And 14:01:00

if Mr. Teague was important, then probably it was 14:01:04

important. 14:01:04

Q. The document that you made reference to on 14:01:08

page 19 -- 14:01:08

A. Uh-huh.

Q. -- of your report -- 14:01:10

A. Right. 14:01:12

Q. -- in 1971, suggesting a possible IBT project, do 14:01:20

you know what "IBT" stands for? 14:01:22

A. I think I have seen that. I can't remember right 14:01:26

off the top of my head. 14:01:28

Q. Do you know -- it's now 1997. Do you know if 14:01:34

R.J. Reynolds ever answered the question posed in 14:01:40

item 4 in the document that you made reference to? 14:01:44

A. I need to get back to that document. I lost it. 14:01:46

Which -- what page are we on? 14:01:50

Q. It's 504 -- 14:01:52

A. I don't have my index that way, just give me on my 14:01:54

report. 14:01:54

Q. Oh, it's page 19 on your report. 14:01:56

A. Okay. Now what's the question? 14:02:08

Q. You made reference to item 4 -- 14:02:12

A. Yeah. 14:02:12

Q. -- on that document -- 14:02:14

A. Uh-huh.

Q. -- which is identified as a possible IBT undertaking. And that was in 1971. 14:02:16 14:02:20

Do you know if now in 1997 R.J. Reynolds has ever answered that question posed in item 4? 14:02:24 14:02:28

A. Well, you know, I have only reviewed a few of the documents in the total context. I have reviewed a lot but I have only reviewed a few of them. I have not seen a document that would say that. 14:02:32 14:02:36 14:02:38 14:02:42

The one right above it, I have seen documents to say that R.J. Reynolds has looked at the nicotine impact from free nicotine and bound nicotine, and its importance -- free nicotine and bound nicotine, the effect of pH on smoke and so on. 14:02:44 14:02:46 14:02:52 14:02:52 14:02:56 14:02:56

So -- and I would have to go through the list and try to -- pH in the mouth, those are things that have been studied, absorption of nicotine in the mouth versus the lungs. 14:03:00 14:03:04 14:03:08 14:03:08

Several of those I have seen documents, some of which were from R.J.R. on those issues, especially the one on pH and impact from free 14:03:12 14:03:16 14:03:20

nicotine and bound nicotine, I have seen documents to speak to that. 14:03:22 14:03:24

So some of this list was done between 1971 and 1997. How much and to what extent it could be in the documents I haven't reviewed. 14:03:30 14:03:34 14:03:34

Q. But at least as you sit here today, you are not aware that you have ever seen a document through and including today in which R.J.R. answered the question posed in item 4 -- 14:03:38 14:03:40 14:03:44 14:03:48

A. Again, I -- 14:03:50

Q. -- on the document referenced on page 19 of your report? 14:03:54 14:03:56

MS. WALBURN: Objection, asked and answered. 14:03:58 14:03:58

THE WITNESS: Well, you know, again, I have reviewed a lot of documents from all of the companies represented here and I don't keep a little catalog of which one R.J.R. did and which one B.A.T. did and which one Brown & Williamson did because they are all basically doing very similar things. 14:04:00 14:04:02 14:04:06 14:04:10 14:04:12 14:04:16

The theme in these documents is that nicotine is a drug of dependence, that nicotine is addicting, and we need to figure out how to deliver it better to keep people smoking. That's kind of the theme if you want to know -- and it's not just 14:04:18 14:04:22 14:04:26 14:04:30 14:04:32

one company, it's all of you, all of you did it. 14:05:38

BY MR. NIMS:

Q. In conjunction with your review of tobacco industry documents and in preparing your report, have you made any comparison of those things that you found in tobacco company documents that you have indicated you believed to be significant and what was 14:05:44 14:05:48 14:05:56 14:05:58 14:06:02

generally known at the same point in time in the outside scientific community? 14:06:06 14:06:08

MS. WALBURN: Objection, form and asked and answered. 14:06:12 14:06:12

THE WITNESS: Well, it's the -- that's a very broad question. I mean, that encompasses all the documents and all of the time that I have spent on that plus all of the literature that's out there as far as scientific literature. 14:06:16 14:06:20 14:06:22 14:06:26 14:06:28

So is there some part of that that you are more interested in? Because intellectually, we make comparisons as we go through these things and try to get the time sequence, and so on, but it's really hard when you have this big a volume. 14:06:32 14:06:36 14:06:38 14:06:42 14:06:44

So is there some particular thing? We talked earlier about the '64 Surgeon General's Report and information that was in the tobacco industry's hands about nicotine is an addicting 14:06:48 14:06:50 14:06:52 14:06:56

drug. That is pretty clear that there was information that would have influenced that process that was not available to the public. 14:07:00 14:07:02 14:07:08

I mean, is there -- are there -- you asked questions about that. Are there -- and that's what I -- help me -- 14:07:10 14:07:14 14:07:14

BY MR. NIMS:

Q. For instance, on that one, you say you believe it was clear that there was information there that was not available to the public. 14:07:16 14:07:18 14:07:18

Have you gone back and compared that information to which you make reference with, say, the Larson volume on tobacco, which was in the general scientific literature? 14:07:22 14:07:26 14:07:32 14:07:36

A. I have not made that comparison. 14:07:38

Q. Okay. 14:07:44

MR. NIMS: I gather we need to change the tape and you need to take a break. 14:07:46 14:07:48

MS. WALBURN: Are we at a point to change the tape? 14:07:52 14:07:54

VIDEOGRAPHER: This concludes the second tape in the videotaped deposition of Dr. Richard Hurt. The time is now 2:07 p.m. 14:07:56 14:07:58 14:08:02

(A recess was taken.)

VIDEOGRAPHER: We are back on the video record. This is the third tape in the videotaped testimony of Dr. Richard Hurt. The time is now 2:23 p.m. 14:23:16 14:23:20 14:23:22 14:23:24

MS. WALBURN: And let the record reflect that according to the videographer and the realtime transcript, the time is 2:23. 14:23:26 14:23:30 14:23:32

MR. NIMS: Dr. Hurt, I have no further questions so I am going to turn it over to somebody else and I thank you for your time, sir. 14:23:36 14:23:38 14:23:40

THE WITNESS: Thank you. 14:23:42

EXAMINATION 14:23:50

BY MR. KEMNA:

Q. Dr. Hurt, my name is Don Kemna and I represent Lorillard in this matter. I just thought I would mention that to you. In the flurry of introductions at the outset of the deposition, I know it's hard to remember names. 14:23:54 14:23:58 14:24:00 14:24:02 14:24:04

Doctor, in taking a look at your curriculum vitae I see that you are a practitioner in the field of internal medicine; is that correct? 14:24:08 14:24:16 14:24:18

A. That's one of the things I do, correct. 14:24:20

Q. Do you consider yourself to be an expert in the field of pharmacology? 14:24:26 14:24:26

MS. WALBURN: Objection, form. 14:24:30

THE WITNESS: As it relates to this topic of nicotine, nicotine dependence, nicotine addiction and the use of these drugs, I do, and it goes all the way back to medical school, pharmacology medical school, pharmacology and training. 14:24:32 14:24:36 14:24:40 14:24:44 14:24:48

You can't -- in medicine today you cannot escape pharmacology, and specifically as it relates to nicotine pharmacology, that is correct. 14:24:50 14:24:54 14:24:58

I get phone calls -- I just got one yesterday from a guy in Texas wanting to know about his own nicotine levels in his urine. So I am viewed not only by myself but by others as being an expert in this. 14:25:00 14:25:02 14:25:06 14:25:08 14:25:16

BY MR. KEMNA:

Q. Would you consider yourself to be an expert on the 14:25:20

chemistry of nicotine? 14:25:22

MS. WALBURN: Objection, form. 14:25:24

THE WITNESS: As it relates to 14:25:24

understanding nicotine as a drug and the way 14:25:30

nicotine is used in the body, the way different 14:25:34

things affect nicotine and how it relates to the 14:25:36

patients that I treat and the research that I do, 14:25:40

yep. 14:25:44

BY MR. KEMNA:

Q. What chemical class would you put nicotine into? 14:25:46

A. It's an alkaloid. 14:25:50

Q. In terms of acid-base chemistry, where would you put 14:25:58

the substance nicotine? 14:26:00

MS. WALBURN: Objection, form. 14:26:04

THE WITNESS: I am not sure what you 14:26:04

mean. Acid-base chemistry is a lot so is there a 14:26:10

specific -- I mean, biochemistry has to do with 14:26:12

acid-based balance. 14:26:14

BY MR. KEMNA:

Q. Uh-huh.

A. Pharmacology has to do with acid-base balance. 14:26:16

Where does nicotine fit into that? 14:26:18

Q. Okay. What's --

A. Acid-base balance is very important to nicotine. 14:26:24

Q. Okay. Let's talk about nicotine in and of itself. 14:26:26

Does it fall on one side or the other? Is it an 14:26:28

acid or is it a base? 14:26:30

18 A. It depends on the solution it's in, depends on the 14:26:32
19 medium it's in. Whether or not it's going to 14:26:34
20 have -- different qualities are dependent upon which 14:26:38
21 medium that it's actually in. If that follows your 14:26:42
22 question. 14:26:44
23 Q. So nicotine, in and of itself, really doesn't have 14:26:46
24 any either acid or base characteristic to it? 14:26:50
25 A. It depends on whether or not it's in a salt form or 14:26:52

1 other form. It depends on the form that it's 14:26:56
2 actually in. 14:26:56
3 It's not a -- depending on the medium that 14:26:58
4 it's in will determine that characteristic, and also 14:27:02
5 will determine the characteristics of absorption, 14:27:04
6 and so on. 14:27:04
7 So it's not -- I am not following your 14:27:08
8 question. 14:27:08
9 Q. Okay.
10 A. Maybe it's too late in the day or something. 14:27:10
11 Q. Well, if it's in the salt form, a nicotine salt, is 14:27:16
12 it an acid or a base? 14:27:16
13 A. In the salt form it would be more -- well, it 14:27:20
14 depends, depends on the medium that it's in. I 14:27:22
15 mean, it's -- depends on the medium that it's in, 14:27:26
16 which would help to determine those characteristics. 14:27:28
17 Q. Is nicotine in a non-salt form an acid or a base? 14:27:40
18 MS. WALBURN: Objection, form. 14:27:42
19 THE WITNESS: In a non-salt form? I would 14:27:46
20 have to look at the chemical formula of it to figure 14:27:50

out what you are driving -- I don't know exactly what you are driving at. 14:27:54 14:28:04

BY MR. KEMNA:

Q. What -- in what forms would you identify nicotine as a salt? 14:28:12 14:28:16

A. A salt is when a compound is combined with another compound. That's kind of the basic definition of a salt. And when it's in a salt form it would be more neutral assuming that the salt, itself, neutralized whether or not it was acid or base to begin with. I mean, that's kind of the way you think about salts. 14:28:20 14:28:24 14:28:28 14:28:32 14:28:34 14:28:40

If you put regular salt, sodium and chloride together then it becomes table salt. I mean, that's -- so it's basically neutral when it's in that form. 14:28:42 14:28:44 14:28:46 14:28:48

But what I am trying to say is if you put that into a different medium, then it will affect whether or not it's acidic or base and you have it not be a salt. I mean, it's -- that's -- and it would not be a salt anymore depending on which medium you put it in. 14:28:50 14:28:50 14:28:58 14:29:00

I mean, that's -- and that's really important for this one because if it's in an acidic environment the absorption of nicotine is very low, or much lower compared to when it's in a basic environment. 14:29:02 14:29:10 14:29:10

When nicotine is in an acidic 14:29:14

environment -- for example, the easiest thing -- the best way to explain this is if I had a piece of nicotine gum in my mouth right now and were using it

to absorb nicotine and I were to put Coca-Cola, which is more acidic, in my mouth at the same time the nicotine gum was there, it would lower the absorption of the nicotine.

If I were to put something in my mouth that were more basic, then it would increase the absorption of nicotine, because when you put something that's more basic in with nicotine then there is more free nicotine which is absorbed more rapidly.

If that -- I am sure you know all this stuff. But that's -- that's the most practical way of thinking about it.

Q. Okay. What I would like you to do, Doctor, is to listen very closely to the question and answer it to the best of your ability, but recognize, that as you have mentioned before, acid-base chemistry is a broad field. So I would like for you to try and not encompass the whole field of acid-base chemistry into a fairly straightforward question.

A. Okay.

MS. WALBURN: Well, I am going to object to counsel's colloquy.

THE WITNESS: I didn't hear what she objected to.

MS. WALBURN: His speech. His speech. 14:30:36

THE WITNESS: Okay. 14:30:38

BY MR. KEMNA:

Q. In what forms would you recognize nicotine as a salt? 14:30:42 14:30:44

MS. WALBURN: Objection, asked and answered, form of the question. 14:30:48 14:30:48

THE WITNESS: It depends on the medium that it's in. I mean, that's the answer, is it -- where is it? 14:30:50 14:30:52 14:30:54

BY MR. KEMNA:

Q. Well, there are different formations of nicotine that is a chemical name where nicotine is recognized as salt. 14:30:56 14:30:58 14:31:00

A. Uh-huh.

Q. What types of chemicals would you regard as nicotine salts? 14:31:06 14:31:08

MS. WALBURN: Objection, form. 14:31:12

THE WITNESS: Well, it -- I'm still -- we are not on the same wavelength, obviously. 14:31:12 14:31:16

Nicotine -- the drug nicotine, the acid-base balance part of nicotine that is critical to the addiction part of this, which is what I thought we were supposed to be talking about, is -- has to do with its absorption. 14:31:20 14:31:22 14:31:26 14:31:30 14:31:32

BY MR. KEMNA:

Q. No, I --

A. And if you take off the hydrogen ions off of it, then it makes it so it is a free base. 14:31:36 14:31:40

So anything that you can do to take the hydrogen ions off of the nicotine molecule then makes it into a free base which then increases its absorption. 14:31:42 14:31:46 14:31:50 14:31:52

You put the hydrogen ions back on it and it becomes the base model or the base molecule of nicotine. 14:31:54 14:31:58 14:31:58

Q. Okay.

A. I mean, I can -- I can't draw you the formula freehand but I can show you one, if you want it. We can look at it that way, that might help, but I -- 14:32:00 14:32:04 14:32:06

MR. KEMNA: Okay. I'll make the objection that it's non-responsive and move to strike. 14:32:08 14:32:12

BY MR. KEMNA:

Q. Perhaps the way to do this is just to mention a chemical name to you and ask you if you recognize it as a nicotine salt. 14:32:16 14:32:18 14:32:20

Is nicotine maleate a salt form of nicotine? 14:32:26 14:32:28

A. Nicotine maleate is a form of nicotine where the maleate is attached to nicotine. Where it's 14:32:32 14:32:36

attached, I guess -- I guess I would have to go and 14:32:40

look as to where that might be attached. 14:32:42

Q. Is it a salt of nicotine? 14:32:44

A. It's a compound of nicotine, right. 14:32:46

Q. Is it a salt of nicotine? 14:32:48

MS. WALBURN: Objection, asked and 14:32:52
answered. 14:32:52

THE WITNESS: It's a compound. Whether or 14:32:54
not it's -- it's a compound, complex compound, and 14:32:56
that can happen with maleate as well as other 14:33:00
chemicals. 14:33:02

Whether it's a salt, I am -- I would have 14:33:08
to -- I am not sure. I would have to maybe look at 14:33:12
the chemical compounds, itself. That's all I can 14:33:16
tell you. 14:33:16

BY MR. KEMNA:

Q. In what form is nicotine present in the tobacco 14:33:20
leaf?

A. Nicotine can be present in its free state, which 14:33:28
is -- has the hydrogen ions attached to it. It can 14:33:30
be in a free-base state in tobacco as it's processed 14:33:36
as well as the way it's delivered. 14:33:38

How it's in -- how it is actually in the 14:33:40
tobacco leaf, I am not sure I can answer that. 14:33:46

Q. So you don't know whether it's in a salt form or a 14:33:50

free-base form in the nicotine leaf -- or in the 14:33:52
tobacco leaf? 14:33:52

A. Oh, I think it can be both, it can be bound and 14:33:56

unbound in the tobacco leaf, and certainly you can do things to manipulate that and get more free-base nicotine by simply making the medium more basic. And I guess that's really the most important thing, is how much free-base nicotine is available for the person using it. 14:34:00 14:34:04 14:34:08 14:34:14 14:34:16 14:34:18

And quite frankly, you know, reviewing -- it's amazing how many different things that the tobacco companies figured out to do with different things to add to and take out of the tobacco leaf. 14:34:22 14:34:28 14:34:30 14:34:34

So there are more things than I probably could ever imagine, but a lot of them are mentioned here in the documents. Maleate is one of them. And -- as well as others that were used to treat the tobacco prior to its incorporation into cigarettes. 14:34:36 14:34:40 14:34:42 14:34:46 14:34:50

So there is a lot of different things that could be done but the driving force is to deliver nicotine at higher concentrations to the organism at hand, which is human beings. 14:34:54 14:34:56 14:34:58 14:35:00

Q. Doctor, are you telling me that you know that nicotine maleate is contained in the tobacco leaf? 14:35:04 14:35:08

MS. WALBURN: Objection, asked and 14:35:10

answered, misstates the testimony. 14:35:12

THE WITNESS: I don't think that I -- I am not sure exactly how I answered that question. 14:35:12 14:35:14

Nicotine maleate was one thing I remember from the documents as far as a way of modifying the nicotine delivery, but I don't -- I guess I am not 14:35:18 14:35:22 14:35:26

sure of all the different types of forms that nicotine is present in the tobacco leaf. 14:35:28 14:35:30

I mean, that's at a level that the -- of understanding that probably is helpful to the person who is trying to manipulate the nicotine. 14:35:36 14:35:40 14:35:42

From my perspective as a treating physician, I am trying to do something entirely different. 14:35:44 14:35:46 14:35:50

BY MR. KEMNA:

Q. So you wouldn't consider within your area of expertise, then, knowing the chemistry behind what it takes to, as you stated it, manipulate the level of nicotine? 14:35:52 14:35:56 14:36:00 14:36:00

MS. WALBURN: Objection, misstates the testimony. 14:36:04 14:36:04

THE WITNESS: No, I wouldn't say that at all. It is important and I do have a very good understanding of how different things are used to manipulate the nicotine as it's delivered, 14:36:06 14:36:08 14:36:12 14:36:18

especially with regard to ammonia and base -- used as a basis to increase the amount of free-base nicotine. 14:36:22 14:36:24 14:36:26

But to have an understanding of all the things that the tobacco industry spent the last 30 years researching, I could spend some more time and I could understand that, but is it important for me to understand that in the relevance of how to treat 14:36:28 14:36:32 14:36:34 14:36:36 14:36:40

the patients and how to deal with this issue? Not that important. 14:36:44 14:36:46

BY MR. KEMNA:

Q. Well, you would agree, wouldn't you, Doctor, that within tobacco products, cigarettes, in particular, the tobacco leaf is a significant component of what makes up a cigarette? 14:36:48 14:36:56 14:37:00 14:37:02

MS. WALBURN: Well, objection, form. 14:37:04

THE WITNESS: If the question is, is tobacco contained in cigarettes, tobacco is contained in cigarettes. Whether or not it's the tobacco leaf, there is a lot of processing that goes on of the tobacco, itself, and I understand that there are stems and other things that are put into tobacco. 14:37:06 14:37:10 14:37:12 14:37:16 14:37:20 14:37:22 14:37:24

So it's not just the leaf. There is a lot of other stuff that goes in. 14:37:26 14:37:28

But we don't really know because there is no real disclosure mechanism to the lay public to know what is actually added to your product. 14:37:32 14:37:36 14:37:40

BY MR. KEMNA:

Q. Well, again, I am not talking to -- 14:37:42

A. I would be interested to know that just from a consumer standpoint, to know what it is that's put into these products. And we, basically, as a public, don't know that. 14:37:44 14:37:48 14:37:50 14:37:52

Q. Okay. So at this point you don't know what else is included within the product cigarettes other than 14:37:56 14:38:00

the assumption that tobacco is included in cigarette products? 14:38:04 14:38:04

MS. WALBURN: Objection, misstates the testimony. 14:38:08 14:38:08

THE WITNESS: We can measure some things that are included in tobacco smoke, such as thiocyanate. Thiocyanate is a metabolic product of cyanide and we can measure that in the urine and the blood and the saliva of people who smoke cigarettes. 14:38:10 14:38:12 14:38:18 14:38:22 14:38:24 14:38:26

So we know the cyanide gets into that chain somewhere. Whether or not it comes from the leaf or if it's added later on, who knows? But there are a variety of substances that we can 14:38:28 14:38:30 14:38:34 14:38:36

measure that are present in cigarettes, in the -- actually, even worse, now we can measure in the people using them. 14:38:40 14:38:44 14:38:44

So if you are kind of missing your daily dose of cyanide, just get it out of your cigarettes, I guess would be one way of thinking about it. 14:38:46 14:38:50 14:38:52

But there are multiple other things that are in there, too. 14:38:54 14:38:56

MR. KEMNA: Objection, non-responsive, move to strike. 14:38:58 14:39:00

BY MR. KEMNA:

Q. Doctor, you understand there is a difference between what is involved as a component of what makes up 14:39:02 14:39:08

cigarettes and what you might describe as the 14:39:12
constituents of cigarette smoke, agreed? 14:39:16
A. I don't follow the question. So what you are saying 14:39:20
is that -- maybe you can rephrase it or expand it a 14:39:24
little bit. I am not -- 14:39:26
Q. You have a product, cigarette. 14:39:28
A. Okay. 14:39:30
Q. And my questions relate to what's in the 14:39:32
cigarette -- 14:39:34
A. Correct. 14:39:34
Q. -- not what's in the cigarette smoke. 14:39:38
So my question gets to what you know about 14:39:42

what is contained within the product cigarette other 14:39:50
than tobacco. 14:39:52
A. Well, if the question is are the things that happen 14:39:56
when a cigarette is burned that produces other 14:39:58
products of combustion, and obviously there are, if 14:40:04
that's -- is that what you mean? 14:40:06
Q. Doctor, I have not asked you about that and the 14:40:08
premise of my question was very clear, that I am 14:40:12
talking about the product cigarettes, not the 14:40:14
cigarette smoke. 14:40:14
And so the question pending is what is in 14:40:28
cigarettes other than the tobacco, itself? 14:40:30
A. It probably depends on the company, actually, if you 14:40:30
want to know the truth about it. From what I 14:40:32
understand from looking at your documents, some 14:40:34
companies add some things to some and other 14:40:36

companies add other things to other. 14:40:38

There is one of the companies, and I think 14:40:38

it's maybe the one that you represent, that hasn't 14:40:42

used the ammonia technology. So I would expect that 14:40:44

Lorillard would not have -- or maybe it was 14:40:48

Liggett. I can't remember. There was one of the 14:40:50

companies that was mentioned in the documents that 14:40:52

doesn't use ammonia technology. 14:40:54

So there are probably differences between 14:40:54

companies as far as what is contained in the 14:40:56

products. 14:40:58

For example, you know, the Philip Morris 14:40:58

issue with ammonia, pH, and so on, clearly there was 14:41:04

differences in those products. 14:41:06

Marlboro back in the '60s compared to R.J. 14:41:10

Reynolds' products, which were -- did not have the 14:41:12

same makeup. 14:41:14

So there's -- there are differences 14:41:18

between cigarettes from the different companies. 14:41:20

Q. Doctor, you have mentioned ammonia. 14:41:22

A. Uh-huh. 14:41:24

Q. Do you know of any other ingredients used in the 14:41:28

makeup of cigarettes other than tobacco and ammonia? 14:41:32

A. Oh, there are more, and I would have to refer back 14:41:36

to the documents that I have had here because, you 14:41:40

know, none of this is public information so I am 14:41:42

relying on what I have learned from the internal 14:41:46

documents, of which there is only a small sample here, they are not all here by any stretch of the imagination. 14:41:48 14:41:52 14:41:52

Q. I understand that, Doctor. I am asking about your present state of knowledge. I don't want you to go through a research project to figure out what you need to do to answer a question, all I am looking 14:41:54 14:41:58 14:41:58 14:42:02

for is what your present state of knowledge is about ingredients in cigarettes. 14:42:04 14:42:08

So what do you know about the ingredients in cigarettes other than tobacco and ammonia? 14:42:12 14:42:14

MS. WALBURN: Objection, asked and answered, and I object to counsel's speech. 14:42:18 14:42:20

THE WITNESS: I just -- you know, there are a variety of things that are there, and again, if you want me to I can go back to these and we can talk about them more. 14:42:24 14:42:26 14:42:28 14:42:30

This is something that you -- when you go through documents like this you remember as much as you can remember about all of this. And that's -- a lot of that stuff was new. In fact, the pH stuff was very new to me as far as a lot of the things that the companies knew when they knew them -- when they knew them that it was very, very interesting. 14:42:34 14:42:38 14:42:40 14:42:44 14:42:46 14:42:50 14:42:52

There is other -- citrates were some things that are mentioned in here as far as being added to to change the pH balance. 14:42:54 14:42:58 14:43:00

There is a whole host of things that were 14:43:02

studied internally as far as -- particularly the pH manipulation, and I can't give you a list because they are all in here, or some of them are in here, and I could go back and do it, but I can't list them

all out for you right this minute.

BY MR. KEMNA:

Q. Well, Doctor, do you hold yourself out in this case as an expert in the ingredients used in the makeup of cigarettes?

MS. WALBURN: Objection, form.

THE WITNESS: Well, as you go back to my expert report, what I have talked about as being an expert is clearly defined there, and the types of things that I relate to have to do with cigarette smoking, with the pharmacology of nicotine, the effect of the drug nicotine on the body, and so on. They are all listed here.

BY MR. KEMNA:

Q. And my question was, do you hold yourself out as an expert on the ingredients used in the makeup of cigarettes?

A. I think only the tobacco companies probably are the true world's experts on this because they have been studying it for, you know, 50 years.

And quite frankly, they haven't bothered to tell everybody. In fact, they haven't bothered to tell anyone except from within.

Q. So you are saying that there is nothing known in the public realm about the ingredients used in tobacco products? That there's nothing known in the public realm about the ingredients used in cigarette products? 14:44:18 14:44:22 14:44:24

MS. WALBURN: Objection, misstates the testimony. 14:44:26 14:44:26

THE WITNESS: That's not what I said at all. What I said was the true world's experts on what goes into cigarettes is the tobacco companies, and what they have done over the last 40 or 50 years is buried somewhere in these as well as other documents. 14:44:28 14:44:30 14:44:30 14:44:34 14:44:38 14:44:38

There is some public written work, and I mentioned one to you. Thiocyanate is something that we use clinically all the time to look at the person's cigarette use and it's a metabolic product of cyanide. There are other things that are written but that's one that comes to mind. 14:44:42 14:44:46 14:44:50 14:44:54 14:44:58 14:45:00

So there are things in the public domain, sure. But as far as the whole list, I don't think the whole list of things that the tobacco companies add to cigarettes are in the public domain. 14:45:02 14:45:06 14:45:08 14:45:12

BY MR. KEMNA:

Q. Did you ever try to find that information, Doctor? 14:45:14

A. Did I ever try to find that information? As far as what all is added to cigarettes? 14:45:16 14:45:18

Q. Yes. 14:45:20

A. It's my understanding that a list is given each year to authorities in Washington which describe what additives are added to cigarettes from the various companies, and they are kept under lock and key. They are very confidential. 14:45:22 14:45:28 14:45:30 14:45:32 14:45:34

In fact, the documents as far as what's contained in the ingredient list is what's called a class 2 level document within these proceedings. 14:45:36 14:45:38 14:45:42

So -- I mean, there are things that the companies have kept secret from everybody. 14:45:56 14:45:56

Q. And so that list of ingredients is kept secret, as far as you know? 14:45:58 14:45:58

A. To the best of my knowledge, it is. I mean, so we try to guess what you all add to these products by measuring different things. But when you start measuring things like thiocyanate and then we also measure nicotine and cotinine, C-O-T-I-N-I-N-E, levels in the blood of the people that use the products -- so we are -- being blind to what you put in the products makes it into somewhat of a guessing game. 14:46:04 14:46:06 14:46:08 14:46:14 14:46:22 14:46:24 14:46:28 14:46:34 14:46:34

So your company knows better about what you put in it than anybody else in the world does, and it's a secret, I think. 14:46:36 14:46:40 14:46:42

Q. Okay. Doctor, from your expert report it seems that you are interested in offering opinions regarding the pH of cigarette smoke? 14:46:52 14:46:54 14:46:56

A. Uh-huh. 14:46:58

Q. Is that correct? 14:46:58

A. That's correct. As it relates to how we deal with patients, how we deal with nicotine replacement therapy, how we deal with understanding the addictive process, how we deal with dealing with this as a drug of dependence. 14:47:06 14:47:10 14:47:12 14:47:14 14:47:18

That's the context in which my expert report is framed. 14:47:20 14:47:22

Q. What is pH? 14:47:24

A. pH is the negative log of the hydrogen ion concentration. 14:47:28 14:47:30

Q. What's a hydrogen ion? 14:47:32

A. Hydrogen ion is probably one of the -- it is the simplest element, basically. It has a proton and an electron, or maybe two electrons. I can't remember if it has one or two. Probably just one. 14:47:36 14:47:44 14:47:48 14:47:50

Q. What's the net charge on a hydrogen ion? 14:47:52

A. Couldn't tell you. 14:47:54

Q. With respect to nicotine, there is a concept within the field of acid-base chemistry known as a dissociation constant. Are you familiar with that, 14:48:06 14:48:14 14:48:20

Doctor? 14:48:24

A. Oh, up to a point I am familiar with that. The KA

theories, and so on, are important in understanding how that works. I am familiar with all that up to a point. I have had a lot of -- a lot of this back in times past. KA is important. 14:48:28 14:48:30 14:48:32 14:48:36

Q. Okay. Is there a dissociation constant identified for nicotine? 14:48:40 14:48:40

A. There is, but I couldn't tell you what it is. 14:48:44

Q. Is there more than one? 14:48:46

A. I don't know. I guess I would have to defer to -- you know, for those really highly technical sorts of things, to one of the other experts in the case that has to do with the chemical engineering part of that question. 14:48:54 14:48:58 14:49:02 14:49:08 14:49:08

Q. Okay. So you are not an expert with respect to the chemistry of nicotine? 14:49:14 14:49:16

MS. WALBURN: Objection, misstates the testimony, asked and answered. 14:49:18 14:49:18

THE WITNESS: That's not what I said at all. I am an expert in pH as it relates to the way I deal with patients, the way I deal with nicotine pharmacology, the way I deal with the delivery of nicotine to the brain, and so on. 14:49:20 14:49:22 14:49:26 14:49:28 14:49:32

I mean, that's what I said earlier. 14:49:38

BY MR. KEMNA:

Q. How do you calculate the balance between bound and unbound forms of a drug knowing the pH of the solution that the drug is in? 14:49:44 14:49:48 14:49:50

A. I probably couldn't calculate that. I would rely on going to a book and looking up the formula. I mean, there is -- the field of medicine, if you don't understand, is very large and we all are working within that largeness. 14:49:56 14:50:00 14:50:02 14:50:06 14:50:08

And trying to understand this field to the extent that I do makes it so that there are some points that are very, very minute, if you will, that are of lesser importance to understand as it relates to taking care of the patient in front of me and understanding their nicotine dependence, their nicotine addiction. 14:50:14 14:50:18 14:50:22 14:50:26 14:50:28 14:50:32 14:50:34

So it's like a rheumatologist. A rheumatologist may be a world expert on rheumatoid arthritis, but they might not know everything there is to know about giant cell arteritis down to the molecular level. 14:50:36 14:50:38 14:50:42 14:50:50 14:50:52

That's beyond the expectations that we as a profession have in order to be claimed an expert in rheumatology or an expert in giant cell arteritis. It's mentally impossible to know all of those details. 14:50:54 14:50:56 14:51:00 14:51:04

Q. So you do recognize your limitations, Doctor; you don't know the basic formula for calculating the balance between bound and unbound proportions of molecules in a certain pH environment, correct? 14:51:04 14:51:06 14:51:10 14:51:16 14:51:18

MS. WALBURN: Object to form and asked and answered. 14:51:20 14:51:22

THE WITNESS: I don't view that as a limitation. That's just something that I would have assistance from from textbooks if I needed to know that or needed to do that. Or I would rely on some other person to help me with that if I needed that answer. 14:51:24 14:51:26 14:51:30 14:51:34 14:51:36 14:51:38

BY MR. KEMNA:

Q. Just like any of us, if we had the question we would go to the expert source of information to make a determination what the balance is knowing what the pH of the environment is and what the drug is, correct? 14:51:40 14:51:42 14:51:44 14:51:48 14:51:48

MS. WALBURN: Objection, form and misstates the testimony. 14:51:50 14:51:52

THE WITNESS: Yeah, it really only has relevance as far as what I do on a daily basis and what I am viewed as by myself and by people outside of Mayo Clinic. 14:51:54 14:51:56 14:52:00 14:52:04

And when people call and ask me about their blood levels -- of what that means with blood levels of nicotine and cotinine, how that relates to a patient, what happens if you alter the pH of the solution that you might be administering nicotine in and so on and so on, those are the relevant issues as far as how I deal with those things on a day-to-day basis. 14:52:14 14:52:16 14:52:18 14:52:22 14:52:24 14:52:28 14:52:30 14:52:34

BY MR. KEMNA:

Q. Do you conduct laboratory analyses of the levels of nicotine or nicotine metabolites in the urine of your patients? 14:52:36 14:52:42 14:52:42

A. Do I, personally, do that? No, because I rely on laboratory medicine people to do that, so that's the way we practice. So there are biochemists I work with, there are laboratory physicians, M.D. types that I work with, there are people in basic science I work with. 14:52:46 14:52:50 14:52:54 14:52:58 14:53:00 14:53:02

So do I run a laboratory doing tests? No. I mean, that would be a waste of my time because I have other things I need to be doing. I mean, I have a lot of things to do with the patients that I do and I do that very well. 14:53:08 14:53:10 14:53:12 14:53:14 14:53:16

Q. Do your peers look to you as an expert in nicotine chemistry, Doctor? 14:53:22 14:53:24

A. You would have to ask them, but I think they do. 14:53:26

Q. They don't ask you -- 14:53:30

A. Otherwise why would they call me? I get phone calls from lots of people from around the country as well as within the institution about all of these things. 14:53:34 14:53:36 14:53:40

Q. But apparently they don't ask you to calculate the balance between bound and unbound proportions of nicotine within a certain pH environment? 14:53:44 14:53:48 14:53:50

MS. WALBURN: Objection, form. 14:53:50

THE WITNESS: I haven't had anybody ask me that question, no. If you -- that's -- that's not been a question that's been asked. 14:53:54 14:53:56 14:54:02

Because the relevance of that in the clinical realm, or even the basic science realm, is -- I am not sure what the relevance would be. 14:54:04 14:54:08 14:54:10

I am sure it's important to your client to understand that because they want to manipulate the nicotine levels in the cigarettes. I am not the one that's doing the manipulating levels of the nicotine, I am just trying to help people stop using the drug. 14:54:16 14:54:18 14:54:24 14:54:26 14:54:28 14:54:30

BY MR. KEMNA:

Q. Doctor --

A. It's a different perspective, you know. 14:54:32

You need to know in your profession what 14:54:34

you need to know to get the job done for the day. And that's just one of those things that I don't need to do -- need to know how to do on a daily basis to do my job, and I am not likely to know how to do that next week, either. 14:54:36 14:54:38 14:54:44 14:54:48 14:54:50

Q. And now you are serving as an expert in this litigation intending to speak about pH levels in cigarettes, Doctor. 14:54:52 14:54:56 14:54:58

A. Uh-huh. 14:54:58

Q. And it may not be a basis for you -- that is a basis of knowledge for you to practice in your field of medicine. 14:55:04 14:55:06 14:55:08

The question is, do you have a foundation of knowledge to understand the concept of pH and how 14:55:10 14:55:14

it applies to nicotine in cigarettes? 14:55:20

Do you have a basis of knowledge in order 14:55:20
to express an opinion regarding the influence of pH 14:55:26
on nicotine in cigarettes? 14:55:28

MS. WALBURN: Objection, asked and 14:55:30
answered. 14:55:30

THE WITNESS: That's a long question. But 14:55:34
the answer is yes. It's based on my knowledge, my 14:55:38
training, what I have learned from the internal 14:55:40
documents. It's based on the research that we have 14:55:44
done, and it has to do with basically all that I do, 14:55:48

and it's all contained here in my expert report as 14:55:52
far as what I intend to testify about. And that's 14:55:54
one of the things. Yes. 14:55:56

BY MR. KEMNA:

Q. Doctor, what research have you done with respect to 14:55:58
the influence of pH on nicotine levels in 14:56:00
cigarettes? 14:56:00

A. You know, I would have to look back. I don't think 14:56:04
we have done anything specifically with regard to pH 14:56:10
in cigarettes. 14:56:12

What we know has to do mainly with the 14:56:16
absorption of nicotine across biological membranes 14:56:20
as it relates to pH and that pH increases the 14:56:24
absorption across biological membranes. 14:56:30

And quite frankly, most of the work has 14:56:32
been done by your companies, and it's only been in 14:56:34
the recent years that work has been done in the 14:56:38

scientific world. 14:56:40

So we have not done a study on the pH of 14:56:46

cigarette smoke, per se, if that's what you mean. 14:56:48

Q. Doctor, you indicated in your answer that pH 14:56:52

increases the bioavailability of nicotine across 14:56:56

biological membranes. 14:56:58

Is that an understandable statement in 14:57:00

science? 14:57:02

MS. WALBURN: Objection, form. 14:57:04

THE WITNESS: I think what I said was that 14:57:06

the pH, the increased -- increased pH increases the 14:57:12

rapidity with which nicotine is absorbed across a 14:57:16

biologic membrane. That's what I think I said. 14:57:20

BY MR. KEMNA:

Q. Well, the testimony will stand for itself. You did 14:57:24

not say the word "increase" before using the word 14:57:26

"pH." That's what I wanted to clarify about your 14:57:28

answer. 14:57:28

A. If I didn't -- I would have to go back and look and 14:57:32

see what I did say. But it increases the rate at 14:57:34

which nicotine crosses biological membranes. The 14:57:38

higher the pH, the higher the absorption, but also 14:57:44

the faster the rate. 14:57:46

Q. Okay. That applies to all biological membranes? 14:57:50

A. I am not sure that all biological membranes have 14:57:54

been tested, per se, but most of the absorption 14:57:58

across biological membranes are similar in the way 14:58:02

that they work, and so it probably does but I don't know that it's been tested across every biological membrane in the entire body. Some are a little bit hard to test. So all is -- it probably does. Probably applies. 14:58:04 14:58:08 14:58:12 14:58:20 14:58:20

Q. Let's take, for instance, the skin, Doctor. 14:58:24

A. Uh-huh. The skin has some particular characteristics. It really -- it's, in the truest sense, not a membrane; the skin is an organ. 14:58:26 14:58:28 14:58:34

Q. Okay. Is it fair to say, Doctor, that -- 14:58:38

A. The skin protects us from our environment. The skin protects us from our environment. So it's an organ, it's not a biological membrane in that sense. 14:58:42 14:58:42 14:58:46

Q. Well, it's composed of biological membranes, correct? 14:58:48 14:58:48

A. It's an organ. 14:58:50

Q. Composed of biological membranes, correct? 14:58:52

A. Well, when we think about biological membranes we think about things like the lining of the mouth or the lining of the GI tract and those sorts of membranes, is the distinction. The skin is an organ. 14:58:56 14:58:58 14:59:02 14:59:04 14:59:04

Q. Well, so is the lung, correct? 14:59:06

A. The lung is an organ. 14:59:08

Q. Okay. Composed of biological membranes? 14:59:10

A. There are biological membranes contained in the lungs. 14:59:12 14:59:12

Q. And so there is biological membranes composed of 14:59:20

skin? 14:59:22

A. There are cells within -- it's a matter of 14:59:28

semantics. The skin has cells that make up the 14:59:30

skin, interdigiting or interlocking cells that make 14:59:40

up the skin. 14:59:40

So if cells are considered a biological 14:59:44

membrane, in your parlance, then yeah, the skin 14:59:46

would be -- but the skin is an organ that functions 14:59:50

very differently than the biological membranes that 14:59:52

line the inside of the lungs and go down into the 14:59:56

alveoli. They are just different. 14:59:58

Q. Understood, Doctor. 15:00:00

A. They are just different. 15:00:02

Q. Different organs, different systems. 15:00:04

A. Right. 15:00:04

Q. You are someone who has conducted some amount of 15:00:08

research regarding transdermal dosage forms for 15:00:14

nicotine, correct? 15:00:16

A. Uh-huh. 15:00:18

Q. Were you involved --

A. We have done work with some of the patches that have 15:00:20

been produced and we have done experiments with 15:00:24

patches that were already products, if you will. We 15:00:28

have not done work leading up to that. 15:00:34

Q. Were you involved in the design of those dosage 15:00:36

forms? 15:00:38

A. No, no. That's what I mean. We did the studies on 15:00:40

25 the -- on the patches before they were approved for 15:00:44

1 FDA use but we did not do the work leading up to the 15:00:48
2 development of the patches, no. 15:00:50
3 Q. Okay. So it's fair to say that the funding by 15:00:56
4 pharmaceutical companies for your work for what you 15:00:58
5 have done in connection with the Mayo Clinic 15:01:00
6 studying nicotine patches relates only to the use of 15:01:04
7 those patches in the clinical setting, not the 15:01:08
8 pharmaceutical chemistry involved in developing the 15:01:12
9 product, itself? 15:01:12
10 MS. WALBURN: Objection, form. 15:01:16
11 THE WITNESS: For the patches, as I said, 15:01:18
12 we did the work looking at the efficacy of the patch 15:01:22
13 in helping people to stop smoking. 15:01:24
14 We have done some work, not directly me, 15:01:28
15 but one of my collaborators, looking at different 15:01:30
16 solutions of nicotine as it's delivered to other 15:01:34
17 organ systems. 15:01:38
18 BY MR. KEMNA:
19 Q. Doctor -- 15:01:38
20 A. And altering the pH of that and so on. So it's -- 15:01:42
21 we have done some of that but that's not -- not me 15:01:44
22 as the principal investigator. 15:01:46
23 Q. Do you consider yourself to be an expert in the area 15:01:50
24 of pharmaceutical chemistry? 15:01:52
25 MS. WALBURN: Objection, form. 15:01:54

THE WITNESS: I don't know exactly what the field of pharmaceutical chemistry is. Maybe that's not a term that's -- 15:01:56 15:01:58 15:02:00

BY MR. KEMNA:

Q. You would acknowledge that there is a field of -- known as pharmaceutical chemistry? 15:02:02 15:02:04

MS. WALBURN: Objection, form. 15:02:08

THE WITNESS: If it's a field, I am not sure how it's defined so maybe you can help me with that. I know there is the pharmaceutical industry, there is pharmacology as a field. Pharmaceutical chemistry, I can see where a person would dub something like that. But as far as a field of science, that's not something that I'm aware of as far as it being called that. I certainly don't call it that. 15:02:10 15:02:12 15:02:14 15:02:18 15:02:24 15:02:26 15:02:32 15:02:36 15:02:36

BY MR. KEMNA:

Q. Well, what field relates to understanding of the bioavailability of pharmaceutical products? 15:02:38 15:02:44

A. That has to do with pharmacology. 15:02:46

Q. Okay. You recognize, of course, that there are subfields within the study of pharmacology, Doctor? 15:02:50 15:02:54

A. Oh, sure. 15:02:54

Q. You just don't recognize the subfield of pharmaceutical chemistry that relates to the design 15:02:58 15:03:02

of pharmaceutical products? 15:03:04

MS. WALBURN: Objection, asked and 15:03:04

answered. 15:03:04

THE WITNESS: It's not a matter of 15:03:06

recognizing it. I mean, I don't go around kind of 15:03:10

recognizing or naming things. 15:03:12

When we deal with the pharmaceutical 15:03:14

industry and the people that work there, there are 15:03:18

pharmacists that we work with, there are physicians 15:03:24

we work with, there are pharmacologists we work 15:03:26

with, and so we work with the -- those types of 15:03:30

people. 15:03:30

And I can't recall any of them ever 15:03:32

saying -- and this is several companies we work 15:03:34

with -- ever saying that I am in the field of 15:03:36

pharmaceutical chemistry. I don't think anyone has 15:03:40

ever said that to me. 15:03:42

Maybe I just wasn't listening but that's 15:03:44

not a term that I am familiar with, nor has it been 15:03:48

said to me by the research director for places like 15:03:50

the likes of Welcomb or other major pharmaceutical 15:03:54

houses. It's probably just a matter of semantics. 15:04:00

BY MR. KEMNA:

Q. Okay. We will try to cut through the semantics and 15:04:02

ask you this question: Are you an expert in the 15:04:04

design of pharmaceutical products? 15:04:06

A. Am I an expert in the design of pharmaceutical 15:04:08

products? 15:04:08

Q. Uh-huh. 15:04:10

A. No, only -- I have knowledge of some of that, 15:04:18
particularly as it relates to nicotine and the 15:04:20
development of -- I mentioned to you already, 15:04:24
discussions about other solutions to use and other 15:04:28
organ systems, which is not something I am at 15:04:32
liberty to talk about because of confidentiality 15:04:36
agreements with other companies and such. 15:04:38
But there are -- I have been involved in 15:04:40
that and I am not sure what level of involvement it 15:04:44
takes to become an expert in -- if becoming an 15:04:48
expert is thinking up a design of a drug and having 15:04:50
it become a drug or drug delivery device that 15:04:54
becomes successful, we could be doing that. I am 15:04:58
not sure yet. 15:05:00

Q. You have never been consulted by any pharmaceutical 15:05:04
company or any other concern regarding the design of 15:05:06
dosage forms of pharmaceutical products; is that 15:05:10
correct?

A. No, that's not correct at all. We talk -- we talk 15:05:16
to -- we work in -- as I explained earlier, we work 15:05:20
in collaboration with a variety of pharmaceutical 15:05:22

companies on the development of their product as it 15:05:26
relates to smoking, smoking cessation, nicotine 15:05:30
dependence treatment, dosage forms, delivery forms; 15:05:34
absolutely. 15:05:34

Q. Okay. 15:05:36

A. Consulted with them, talk with them, work with them, help them to figure out how to do those things. So if that's what you are talking about as far as design, then yes, I have done a lot of that, as a matter of fact. 15:05:40 15:05:44 15:05:46 15:05:50

Q. Is pH important in the design of the nicotine patch? 15:05:52

A. It probably isn't as important for that one as it is for the gum because, again, the major barrier in this one is the skin, and so the patch has to do with the flux rate of the nicotine across the skin rather than the other factors, so it's more of a physical factor. 15:05:58 15:06:04 15:06:08 15:06:12 15:06:16 15:06:16

So some of the companies have had to use higher levels of nicotine within the patches in order to increase the flux rate across the skin, whereas some have used a smaller amount of nicotine but in a direct form without the layers and the wafering that some of the other companies have put into their patch design. 15:06:18 15:06:22 15:06:24 15:06:28 15:06:30 15:06:34 15:06:36

So it's of less -- obviously you wouldn't want to put something with a very caustic or a very acidic pH onto the skin. 15:06:36 15:06:40 15:06:42

The other part is the volatility of nicotine and the more free-base nicotine you have in the product the more difficult time the pharmaceutical companies have in packaging it, sealing it, making sure it says -- in packaging it, sealing it, making sure that the nicotine is 15:06:46 15:06:50 15:06:50 15:07:02 15:07:02 15:07:04

actually there for the delivery once they do apply to the skin. So in that sense it is somewhat important. 15:07:06 15:07:10 15:07:10

But the real design problem with the nicotine patches is how do you get it to go across the skin because the skin, unlike the biologic membrane that's contained in the lungs, is really a protective device and the very delicate structures that are present in the alveoli are only one-cell thick on the alveolar side and also one-cell thick on the capillary side. 15:07:12 15:07:16 15:07:20 15:07:24 15:07:26 15:07:30 15:07:34 15:07:36

So once you deliver the drug to that level, the influence of the drug going across that membrane is really different. In other words, the factors involved are different than they are going across the skin. 15:07:38 15:07:42 15:07:42 15:07:44 15:07:46

Q. What's the physiological concept or the name of the concept for the passage of a substance like nicotine through a biological membrane? 15:07:52 15:07:58 15:08:00

A. I don't know what you mean. The process? 15:08:04

Q. Biologically how do you describe it? A drug is on one side of the membrane and it goes to the other side of the membrane. What's the process called for it going through -- 15:08:10 15:08:12 15:08:14 15:08:16

A. Well, it's diffusion but it can be -- diffusion can be active or passive. So if it's passive diffusion, then there is no active transport of the drug 15:08:22 15:08:26 15:08:30

across -- or the substance across the membrane. If it's active diffusion, there may be some other expediting factor in the cell that helps to move the substance across the membrane. 15:08:32 15:08:34 15:08:40 15:08:42

Q. Okay.

A. So it can be passive diffusion or active diffusion. 15:08:46

Q. Well, the question related to nicotine. 15:08:48

A. Say again. 15:08:48

Q. The question related to nicotine. 15:08:50

A. Uh-huh. 15:08:50

Q. Okay? What concept applies to the passage of nicotine across a biological membrane? 15:08:58 15:09:00

A. It's more of a diffusion sort of situation except when nicotine gets to other places, like when it gets to the brain it really has to do with landing 15:09:02 15:09:06 15:09:08

on receptors and activating receptors, so -- and it depends on the state that it's in. 15:09:12 15:09:12

If it's a salt -- in a salt form it's bigger, it's bulkier, it has more trouble passing through the channels that are opened through these biological membranes. 15:09:16 15:09:20 15:09:22 15:09:24

If it's in a free-base form it passes more rapidly. It's, basically, a smaller molecule, so it just passes by through diffusion. 15:09:26 15:09:28 15:09:32

Q. Okay. I understand the concept of diffusion. What I am getting to is with respect to nicotine, is it passive diffusion or active transport? 15:09:34 15:09:36 15:09:38

A. When it gets down to the alveoli in the lungs, it is 15:09:44

just diffusion, passive diffusion across those biological membranes. 15:09:50 15:09:52

Q. Is there ever a situation in the body where nicotine is actively transported by some mechanism across biological membranes? 15:09:54 15:09:56 15:09:58

A. Well, if ever is a lot -- I am trying to think. I don't know of any, but that doesn't mean that there couldn't be. I don't know of any off the top of my head. 15:10:14 15:10:18 15:10:20 15:10:22

But it's a very complicated process. It's not quite as simple as just is it this or is it that? It depends upon the pH, it depends upon the 15:10:24 15:10:28 15:10:34

part of the body affected, it depends on the other things that are in that medium at that time, and that determines how it's absorbed. 15:10:36 15:10:38 15:10:40

So there is more than just one or two factors. 15:10:44 15:10:44

Q. Now, you talked about the skin as a barrier. What is it about the skin that acts as a barrier to absorption? 15:10:48 15:10:50 15:10:52

A. The skin is a protective organ, so the skin is made up of cells that are tightly interdigited like this together (indicating) so that they make plates -- basically, plates through which things are not absorbed. 15:10:58 15:11:04 15:11:08 15:11:10 15:11:10

And so you have to overcome that as a barrier to get things to go through it. 15:11:14 15:11:16

On the other hand, the skin is a wonderful protective device because we are exposed to bacteria all the time that can't work their way through the skin. So it is the physical properties of the skin that gives its protective capabilities. 15:11:18 15:11:22 15:11:24 15:11:26 15:11:30

Q. Is lipid solubility important for whether a drug is absorbable through the skin? 15:11:36 15:11:38

A. It probably has some importance and lipid solubility has importance for absorption of drugs in other places as well, other sites in the body. 15:11:48 15:11:52 15:11:54

Q. Is it important for a site like the lungs? 15:11:56

A. Depends on the -- depends on what part of the lungs we are talking about. The lungs are a very complex organ just like others are. So if you get down to the end terminal alveoli, it has lesser importance there because once a substance gets to there it really is diffusion across that very thin delicate two-layer membrane. 15:11:58 15:12:00 15:12:04 15:12:10 15:12:12 15:12:18 15:12:20

Higher up in the tracheobronchial tree lipid solubility is more important. 15:12:24 15:12:28

Q. So if I understood your answer correctly, you are saying that there really isn't much of a barrier to absorption at the level of alveoli in the lungs? 15:12:30 15:12:32 15:12:34

A. Once it gets to that level the absorption is fairly quick, yeah. 15:12:38 15:12:40

Q. Okay.

A. I mean, it's only two -- you understand, there is only two cell layers, there is the cell layer of the 15:12:44 15:12:46

alveoli and there is one cell layer of the capillary, and that's all that separates the gas, the carbon dioxide and oxygen from the bloodstream. 15:12:48 15:12:54 15:13:00

Q. All right.

A. So it's a very delicate membrane, so it has less -- less importance for lipid solubility there than it does other places higher up which are thicker and 15:13:04 15:13:08 15:13:12

have more physical properties, as well. 15:13:14

Q. Are you saying that absorption at the level of the alveoli happens immediately or fairly instantaneously, if that's an appropriate description? 15:13:18 15:13:24 15:13:28 15:13:28

MS. WALBURN: Objection, asked and answered. 15:13:30 15:13:32

THE WITNESS: It is very rapid. Instantaneously is -- it's very rapid. Once you get something to the level of the alveoli, then the absorption can take place very rapidly. 15:13:34 15:13:36 15:13:38 15:13:42

MS. WALBURN: Can we take a break? 15:13:52

THE WITNESS: Yeah, that would be good for me. It's 3:15. 15:13:54 15:13:56

VIDEOGRAPHER: Temporarily going off the video record. The time is now 3:13. 15:14:00 15:14:04

MS. WALBURN: And let the record reflect that according to the videographer and the realtime transcript, we went off at 3:13 p.m. 15:14:06 15:14:08 15:14:12

MR. WILSON: Fifty minutes from the 15:14:14

beginning of this session. 15:27:36

(A recess was taken.) 15:30:20

VIDEOGRAPHER: We are back on the record. 15:38:36

The time is now 3:38 p.m. 15:38:46

BY MR. KEMNA:

Q. Doctor, how does nicotine make its way from the cigarette tobacco into cigarette smoke? 15:38:50 15:38:52

A. It's basically a process of distillation where nicotine, in its native form, is a liquid, and so when the cigarette smoke is heated, then it becomes a vapor form and that's carried through the rod. And then as it cools, it becomes a liquid again and it becomes part of an aerosol that's taken in along with a bunch of other things other than just nicotine. It comes out the end. That's what the smoke is, is an aerosol. 15:39:00 15:39:04 15:39:08 15:39:14 15:39:18 15:39:22 15:39:26 15:39:28 15:39:30

Q. Okay. So -- 15:39:32

A. So nicotine is carried in by something else. 15:39:34

Q. At least initially, Doctor, the nicotine then all volatilizes into a vapor phase form of nicotine; is that correct? 15:39:42 15:39:48 15:39:48

MS. WALBURN: Objection to form, and the "all volatilizes." 15:39:50 15:39:54

THE WITNESS: Yeah, I don't know if it all does, or not. It may, but I -- 15:39:56 15:39:58

BY MR. KEMNA:

Q. Does most of it volatilize into the vapor phase of nicotine? 15:40:02 15:40:02

24 A. A lot of it does. I mean, there is more nicotine in 15:40:12
25 the cigarette than actually ever comes out the other 15:40:16

1 end, so whether or not it's all -- all or most all 15:40:20
2 volatilized -- a large percentage is, but I -- and 15:40:26
3 then, again, it also depends on which cigarette we 15:40:28
4 are talking about. 15:40:30
5 All cigarettes aren't alike. 15:40:32
6 Q. Okay.
7 A. There are different -- different forms and different 15:40:36
8 additives and such that are used. 15:40:38
9 So they are different. 15:40:40
10 Q. Does it make a difference to your opinions as to 15:40:44
11 which brand of cigarette you are talking about with 15:40:46
12 respect to the chemistry of nicotine and the 15:40:52
13 cigarette and cigarette smoke? 15:40:54
14 MS. WALBURN: Objection, form. 15:40:56
15 THE WITNESS: It only has to do with the 15:40:58
16 way that that's manipulated by the particular 15:41:00
17 company. And so there will be some things done by 15:41:06
18 one company versus another. There are differences 15:41:08
19 between the cigarettes within companies to some 15:41:12
20 degree, but certainly between companies. 15:41:14
21 BY MR. KEMNA:
22 Q. Okay. 15:41:14
23 A. So if that makes a difference, yeah, it makes a 15:41:18
24 difference to the brand. But it really has to do 15:41:20
25 with the delivery of the nicotine, itself, and how 15:41:22

fast it gets in; that's really the critical issue. 15:41:26

Q. In discussing cigarette smoke you understand the difference between mainstream smoke and sidestream smoke, don't you, Doctor? 15:41:30 15:41:34 15:41:36

A. Well, I think so. Mainstream stream would be the smoke coming through the end of the rod and sidestream smoke would be what's left off and not inhaled by the individual, if that's what you mean. 15:41:38 15:41:42 15:41:46 15:41:46

Q. In mainstream smoke when the nicotine first makes its way from the tobacco in the cigarette to the mainstream smoke, is the nicotine in a vapor phase? 15:41:48 15:41:52 15:41:58

MS. WALBURN: Objection. 15:42:00

THE WITNESS: It is distilled. I mean, that's what we talked about earlier, it is distilled fairly early on whenever the heat rises to the point that it becomes a vapor before it's aerosolized with these other things that go through the cigarette. 15:42:04 15:42:08 15:42:12 15:42:16 15:42:18

BY MR. KEMNA:

Q. Okay. 15:42:20

A. I mean, I can't tell you if that's within -- I am not sure what the point of the question is except that's what I understand to be the case. It's distilled, in simple terms. 15:42:22 15:42:26 15:42:30 15:42:32

Q. Okay. When the nicotine is in a vapor phase form, is it a free-base form or is it a salt form of 15:42:38 15:42:46

nicotine or some other form of nicotine? 15:42:48

MS. WALBURN: Objection, form. 15:42:50

THE WITNESS: I think it can be, as -- as we talked about earlier, it can be in different forms within the tobacco leaf to begin with. And so I would assume it can be in different forms even after it has been vaporized. 15:42:54 15:42:56 15:42:58 15:43:02 15:43:04

And then other things happen to it as it becomes an aerosol, as it collects onto or within the other things before it actually comes out to be part of the smoke. 15:43:08 15:43:12 15:43:14 15:43:16

BY MR. KEMNA:

Q. Okay. Let me ask the question this way, because I think you have a tendency not to want to talk in absolutes and I understand that. 15:43:18 15:43:20 15:43:24

Nicotine, in the vapor phase, is it primarily in the free-base form or is it primarily in the salt form? 15:43:26 15:43:32 15:43:36

MS. WALBURN: Objection, asked and answered and the form of the question. 15:43:38 15:43:40

THE WITNESS: I think that depends on the medium that it's in. If it's in a more basic medium, if it has a higher pH within whatever medium we are talking about, it would be more free base. If it's in a more acidic medium, it would be more in 15:43:42 15:43:44 15:43:48 15:43:50 15:43:54

the salt form. 15:43:54

So the medium -- you can't separate out the medium from what happens to it. I mean, that's -- you just -- they are too inseparable. 15:43:58 15:44:04 15:44:08

And there are so many other things in smoke and in tobacco and so many things that are added to it that we don't know about, there is not a simple answer to your question. 15:44:10 15:44:14 15:44:20 15:44:22

If you were to just take tobacco off of a plant and not add anything to it, I am still not sure that everyone would know which form it would be in because there is probably nuances of even the tobacco plants, themselves. 15:44:22 15:44:30 15:44:32 15:44:36 15:44:36

There are some tobacco plants that have more nicotine in them and there is probably a relative difference in the amount of free and salt forms of nicotine depending on the plant, where it's grown, you know. 15:44:38 15:44:42 15:44:48 15:44:54 15:44:56

BY MR. KEMNA:

Q. Does the free or salt form of nicotine as found in the tobacco in the cigarette relate to the balance of free or bound nicotine contained within the initial vaporized nicotine from the distillation process? 15:45:00 15:45:02 15:45:06 15:45:10 15:45:10

A. If I understand the question, which was -- it's a long question. So you are asking is if the free and the bound state of the tobacco contained in the cigarette is related to what actually ends up coming out. 15:45:18 15:45:20 15:45:24 15:45:28 15:45:28

I would assume so, but I am not sure -- I am not sure if I know that. I have seen some things in your documents that speak to that issue but I am not sure I know the absolute answer to that. 15:45:38 15:45:40 15:45:44 15:45:48

My assumption would be that it would be that way but there may be something that happens in the distillation process that might -- it may be that way but there may be some other things within the distillation process, depending upon what else is added to the cigarette. 15:45:54 15:45:56 15:45:56 15:46:00 15:46:02

I mean, if you add other things that affect the acid-base balance that are dependent upon combustion, then once you do that, then you would change the mix of free and salt form nicotine at the time of combustion, if you follow that logic. 15:46:04 15:46:08 15:46:12 15:46:18 15:46:22

So I -- the assumption would be that they are probably related but it depends upon what else is added. So if you add a lot of acid to the tobacco or a lot of base to the tobacco, one -- on the one hand, or if you add a substance to tobacco that changes into a base form once it's combusted, 15:46:26 15:46:28 15:46:30 15:46:34 15:46:38 15:46:42

that would also increase the free-base form of nicotine above and beyond what would have been in the native tobacco to begin with. 15:46:44 15:46:46 15:46:50

So it depends, is the right answer. 15:46:52

Depends on what other substances are in the tobacco and what other substances are maybe transformed into 15:46:56 15:46:58

an acid or base based on combustion. And I don't know what those might be but there probably are some. 15:47:02 15:47:04 15:47:04

Q. Has the pH of cigarette smoke that is mainstream cigarette smoke been measured? 15:47:10 15:47:14

A. I think I have seen some reference to mainstream and sidestream smoke measures of pH in these internal documents. 15:47:16 15:47:20 15:47:20

Q. Okay. 15:47:22

A. So the answer is yes, but I think it's been measured mostly by the companies. 15:47:26 15:47:26

Q. What's your understanding of the range of pH found in commercial cigarettes from manufacturers in the U.S.? 15:47:32 15:47:36 15:47:36

A. It depends on which year and it depends upon which cigarette, and it depends on what was being added. I mean, it's -- 15:47:42 15:47:46 15:47:48

Q. Let's look at it from the point of view of what's reported by the Surgeon General's Reports. 15:47:50 15:47:54

What do they report as the range of pH values of cigarette smoke in commercial cigarettes in the U.S.? 15:47:58 15:48:02 15:48:02

A. Well, you know, unfortunately, I think that sometimes what the Surgeon General had, as we talked earlier, may not have been the best information because in one of the documents is a chart that has -- I am on 511223470, "pH Concept and Scale," and it talks about pH battery acid at the bottom all 15:48:06 15:48:10 15:48:16 15:48:20 15:48:26 15:48:32

the way to lye at the top. To lye, L-Y-E, not L-I-E. 15:48:34 15:48:36

And then over three pages later it has a chart on 511223474 which talks about flue-cured stems, burley stems, Marlboro G-7, and so on. And then even beyond that is how does pH relate to not just nicotine delivery but sale. 15:48:42 15:48:50 15:48:54 15:49:00 15:49:04

So -- and I can't remember the date on this document but it wasn't last week. So depending on which Surgeon General's Report you are talking about, it may not have been available to the people writing the Surgeon General's Report because it was a confidential document. 15:49:06 15:49:12 15:49:14 15:49:18 15:49:20 15:49:22

I think the best information about pH is in your own files about these products. 15:49:24 15:49:26

Q. Doctor, I generally don't mean to interrupt the witness's answer but your answer is entirely non-responsive to the question. 15:49:30 15:49:32 15:49:36

The question gets to your knowledge of the range of pH in commercial cigarettes in the U.S. as reported by the Surgeon General. 15:49:38 15:49:42 15:49:46

Do you know the answer to that question? 15:49:46

MS. WALBURN: Objection to counsel's speech and asked and answered. 15:49:50 15:49:50

THE WITNESS: Which Surgeon General, which year, which -- 15:49:52 15:49:54

BY MR. KEMNA:

Q. Any Surgeon General, any year. 15:49:56
A. Show me the report. 15:49:58
Q. Do you know any information -- 15:50:04
A. Show me the report --
Q. -- as reported by the Surgeon General? 15:50:08
A. -- and we'll talk about what that Surgeon General said. 15:50:12 15:50:14
Q. Do you know any information from any year the Surgeon General has reported? 15:50:14
A. The Surgeon General's Reports are very -- there is a lot of them. So if you will tell me which one you are talking about, we can look and see what's in that Surgeon General's Report. 15:50:14 15:50:18 15:50:20 15:50:20
And furthermore, the pH of cigarette 15:50:24

smoke, as I have tried to explain to you, has been varying depending on which company and what they do and when it was done. 15:50:26 15:50:36 15:50:38
So what the Surgeon General's Report might say in 1988 -- if we had that we could look at it and see -- but I am not sure that would be the best information at all. 15:50:40 15:50:42 15:50:44 15:50:44
Q. Do you have any idea based on any source of information what the range of pH is expected in cigarette smoke of commercial cigarettes in the U.S.? 15:50:46 15:50:50 15:50:54 15:50:56
MS. WALBURN: Objection, asked and answered?
THE WITNESS: For Marlboro G-7, it looks 15:51:00

like it's probably 7. -- no, 6.6 or so. 15:51:02

For Kool, it's less than that; for Camel, 15:51:04

it's less than that; for Salem, it's less than that; 15:51:08

for Winston, it's less than that. For Winston, it's 15:51:10

less than 6. 15:51:12

BY MR. KEMNA:

Q. Uh-huh.

A. So Kools, Marlboro are between 6 and 7. Marlboro is 15:51:18

the highest as far as the pH. And that is dated 15:51:24

1972. 15:51:26

Q. Now, based upon -- take any one of those pH values, 15:51:30

let's take pH of 6. 15:51:32

A. Okay. 15:51:32

Q. Okay? You agree that's within the range of pH 15:51:36

values for commercial cigarettes in the U.S.? 15:51:40

A. In 1972. 15:51:42

Q. All right. What percentage of nicotine within smoke 15:51:48

at a pH of 6 is in the free-base form? 15:51:52

A. pH of 6? I would have to look further in here to 15:52:00

give you that answer. 15:52:02

Q. Can you estimate for me? 15:52:04

MS. WALBURN: Objection. 15:52:04

THE WITNESS: No. I really would have to 15:52:08

get more information. It would take me -- I would 15:52:10

be glad to look it up if you want me to do that. 15:52:14

At a pH of 8, it looks like -- according 15:52:30

to these documents, at a pH of 8, that free nicotine 15:52:34

would be in the close to -- a little less than 60 percent would be in the free form, according to this chart, at a pH of 8. 15:52:40 15:52:42 15:52:48

At a pH of 6, the free nicotine is a smaller amount, and as the higher the pH goes up there is more free nicotine, according to this. 15:52:52 15:52:56 15:53:00

BY MR. KEMNA:

Q. How much smaller? 15:53:02

A. It's a graph. You have to look at it. You can't 15:53:04

make it into numbers. It looks like this (indicating). So it's a graph. 15:53:08 15:53:10

Q. Can you estimate what the number is? 15:53:14

MS. WALBURN: Objection, asked and answered. 15:53:14 15:53:16

THE WITNESS: I can't. It's a graph and graphs are hard to read because you can't get real specific as far as decimal points and stuff. 15:53:16 15:53:20 15:53:24

BY MR. KEMNA:

Q. Have you studied the extent to which ammonia, as you reported in your expert report, influences the proportion of nicotine in cigarette smoke that would be in the free-base form? 15:53:28 15:53:34 15:53:38 15:53:40

MS. WALBURN: Objection, form. 15:53:42

THE WITNESS: Which part of my report are you talking about? 15:53:42 15:53:46

BY MR. KEMNA:

Q. Well, it starts on I think probably page 20 where you talk about the pH. And you also make reference 15:53:50 15:53:54

to the addition of ammonia compounds on page 21. 15:53:58

A. Okay. 15:54:02

Q. And my question stands. 15:54:04

A. So what's the question? 15:54:06

MR. KEMNA: Can you read back the question. 15:54:08

(The record was read by the court reporter.)

MS. WALBURN: Objection, form, vague. 15:54:24

THE WITNESS: I have got 20 out, so you said 21, also, is that right? 15:54:26 15:54:28

BY MR. KEMNA:

Q. Page 21. 15:54:30

A. 20 and 21. So what is it about page 20 that you want to know about that part, at the bottom of page 20? 15:54:34 15:54:38 15:54:38

MR. KEMNA: Can you repeat the question for him, please? 15:54:40 15:54:42

(The record was read by the court reporter.)

MS. WALBURN: Objection, form, vague. 15:55:04

THE WITNESS: So I guess I can try to take it in a couple of steps because I -- it's -- there is too much on these two pages just to kind of answer it like the way that you are asking. 15:55:06 15:55:10 15:55:14 15:55:16

At the bottom -- 15:55:18

BY MR. KEMNA:

Q. Let me just interpose that you are the one that chose to refer to the report. I was just making a reference to the portion of your report where I was pulling my question from. 15:55:20 15:55:22 15:55:24 15:55:26

It doesn't relate to the content of your report, it relates to the question, itself, and a response to the question. 15:55:28 15:55:30 15:55:32

MS. WALBURN: Well, excuse me, counsel, but you interrupted Dr. Hurt. 15:55:34 15:55:36

THE WITNESS: So it has to do with the report. And I am just asking which part of the report you are asking the question about. 15:55:36 15:55:38 15:55:42

BY MR. KEMNA:

Q. And I have directed you to it. 15:55:44

A. So page 20 and 21. That's a lot of words and there is a lot of things on both of those pages. 15:55:48 15:55:50

Q. Let me clarify before you attempt to answer. 15:55:54

Page 20 indicates that you were talking about research on the control of nicotine by altering pH levels in cigarettes. 15:55:58 15:56:00 15:56:02

A. I said, "The internal documents also reveal research on the control of nicotine by altering the pH levels of cigarettes." Yeah, that's what the internal documents say. 15:56:04 15:56:10 15:56:12 15:56:14

Q. And on page 21 you indicate one way to control the pH and effect transfer of nicotine is the addition of -- is through the addition of ammonia compounds, correct? 15:56:16 15:56:20 15:56:24 15:56:24

25 A. So -- 15:56:26

1 Q. Last paragraph. 15:56:26
2 A. Oh, the last. You skipped over -- see, that's my 15:56:30
3 point. You have gone from one to the other, 15:56:32
4 skipping over it because I would have probably 15:56:34
5 talked about the one in between. 15:56:34
6 Q. That's okay.
7 A. So I need to have you be more specific. 15:56:38
8 Q. That's okay. 15:56:38
9 A. Okay.
10 Q. Just go to the one that I have indicated. 15:56:46
11 A. Okay. "One way to control the pH and effect the 15:56:58
12 transfer of nicotine to the smoker is through the 15:57:00
13 addition of ammonia compounds." 15:57:02
14 Q. Okay.
15 A. Is that what you want to know about? 15:57:02
16 Q. Right. 15:57:04
17 A. Okay. 15:57:04
18 Q. Okay. Now, the two sentences that we both have read 15:57:06
19 tie in pH with the use of ammonia compounds. And my 15:57:10
20 question is, have you studied the extent to which 15:57:14
21 the pH of cigarette smoke influences the proportion 15:57:18
22 of nicotine that would be found in the free-base 15:57:22
23 form? 15:57:22
24 A. It's probably in some of the things that I have read 15:57:28
25 in these documents, but I -- I mean, again, these 15:57:30

are -- there's a lot of documents here. 15:57:32

And I think it also depends upon how much ammonia was added. You know, there was one document I recall that talked in terms of -- in the commercial cigarettes in the U.S. that there is the equivalent of 10 milligrams of ammonia per cigarette as of one point in the late 1980s. 15:57:36 15:57:40 15:57:44 15:57:46 15:57:50 15:57:52

So if one company is adding more ammonia than others, then that would affect this. So I think that would affect the percentage we are talking about as far as the percentage of free-base nicotine. 15:57:54 15:57:58 15:58:00 15:58:02 15:58:02

So if one company is adding more or if one company is adding different things that might alter the pH that would affect the percentage of nicotine in the free-base form. 15:58:04 15:58:08 15:58:12 15:58:14

Q. Okay. Doctor, let's break this up a bit. And first of all, I appreciate the fact that you have looked at company documents. 15:58:20 15:58:24 15:58:26

Let's talk about your basis of knowledge to know about the influence of ammonia on the proportion of free-base nicotine that may be found in cigarette smoke. 15:58:28 15:58:32 15:58:36 15:58:38

Apart from reviewing these documents, have you ever looked at any information that relates to 15:58:40 15:58:44

the question of whether ammonia compounds that may have been used in the manufacture of cigarettes had any influence on the proportion of unbound nicotine in the cigarette smoke? 15:58:46 15:58:50 15:58:54 15:58:54

MS. WALBURN: Objection, form. 15:58:56

THE WITNESS: That's a huge question. 15:58:58

There is scientific literature that has to do with pH, but there is really not very much of it because one of the biggest surprises to me about these internal documents was how much your client knew about pH and nicotine manipulation that no one else knew. 15:59:02 15:59:06 15:59:08 15:59:14 15:59:18 15:59:18

And that includes the scientific community as well as the lay community. There has been a little bit written about pH in the medical literature, but not very much compared to these volumes written 20 or so years ago about pH technology and ammonia. 15:59:22 15:59:26 15:59:28 15:59:32 15:59:36 15:59:38

I am not sure that I ever did see anything prior to these documents to do with ammonia particularly, except in the newspaper. 15:59:40 15:59:44 15:59:46

I mean, it hit the newspapers -- the New York Times had ammonia technology used in cigarettes to increase nicotine transfers last year sometime as I -- or maybe a year and a half ago or two years ago. 15:59:50 15:59:52 15:59:54 15:59:58

So what I said earlier in this was really 16:00:00

true, is that what we knew in the medical world was woefully less or much, much less than what was known in the people that were doing this to the cigarettes and the companies. 16:00:04 16:00:10 16:00:14 16:00:16

BY MR. KEMNA:

Q. Doctor, does pH have anything to do with the amount of nicotine that is actually transferred from the cigarette tobacco into the cigarette smoke? 16:00:18 16:00:22 16:00:28

MS. WALBURN: Objection, form. 16:00:30

THE WITNESS: It has to do with the rapidity with which it's absorbed. The pH in the free-base form have to do with the rapid -- rapidity of -- pH has to do with the rapidity with which nicotine is absorbed. 16:00:34 16:00:40 16:00:42 16:00:42 16:00:44

So if it is absorbed faster and you only have a certain length of time, finite time, in order to have the organism exposed to it, in that sense it would probably increase the amount that would be absorbed. 16:00:48 16:00:50 16:00:56 16:00:56 16:00:58

But the main thing it does is it increases the rate of absorption. It makes it faster. It goes in faster. 16:01:00 16:01:02 16:01:04

MR. KEMNA: Objection, non-responsive, move to strike. 16:01:06 16:01:06

THE WITNESS: What was the question? Can you repeat the question? 16:01:08 16:01:10

(The record was read by the court reporter.)

THE WITNESS: It has to do with it as far as the time sequence is concerned, absolutely. If you only have a certain amount of time that you are smoking the cigarette, the faster you get the nicotine into a free-base form, the faster it's absorbed. 16:01:22 16:01:26 16:01:28 16:01:32 16:01:34 16:01:34

And so in that respect, it does affect the amount of nicotine that would be absorbed from the cigarette, yes. 16:01:38 16:01:40 16:01:40

BY MR. KEMNA:

Q. Okay. Doctor --

A. That is responsive to your question. 16:01:42

Q. Your answer is not responsive because you are talking about absorption. I am talking about the amount of nicotine transferred from the cigarette tobacco into the cigarette smoke. 16:01:46 16:01:48 16:01:50 16:01:54

A. Uh-huh.

Q. Do you know whether pH has anything to do with the amount of nicotine that would transfer from the cigarette tobacco into the cigarette smoke short of 16:01:58 16:02:04 16:02:08

any consideration of rate of absorption? 16:02:12

MS. WALBURN: Objection. Objection to counsel's speech, objection to the form of the question and objection, asked and answered. 16:02:16 16:02:18 16:02:20

MR. KEMNA: The question is what it is. It's not a speech, it's a question. 16:02:22 16:02:24

MS. WALBURN: Well --

MR. KEMNA: Apparently, the doctor requires context for the question in order to understand it. That's what it is. 16:02:26 16:02:28 16:02:30

MS. WALBURN: Well, your question, as phrased, I think would be impossible to answer except to the extent it's already been answered. 16:02:32 16:02:34 16:02:38

MR. KEMNA: Well, let's find out if the doctor can answer. 16:02:42 16:02:44

THE WITNESS: Let me try and take another crack at it. Because what you don't understand is I deal with real-life people who are smoking cigarettes. 16:02:46 16:02:48 16:02:50 16:02:50

And I think where you get confused is that you are talking about the delivery of nicotine in the FTC method of nicotine delivery in smoke. That is irrelevant when it comes to the way that people smoke cigarettes. 16:02:52 16:02:54 16:02:56 16:03:00 16:03:02

So if you are talking about the FTC method 16:03:04

of measuring the nicotine in the smoke, you might be correct, depending upon the rate that the cigarette is smoked. 16:03:08 16:03:10 16:03:12

But in real live human beings the delivery -- the rapidity of the delivery has to do with how much nicotine actually gets into the organism. And the only way it can get into the organism is through the smoke. 16:03:14 16:03:18 16:03:22 16:03:24 16:03:26

So if a person smokes it more rapidly, then the pH has to do with how much gets into the 16:03:28 16:03:32

system and amounts. So it's time-dependent, it's not just amount-dependent. 16:03:36 16:03:38

BY MR. KEMNA:

Q. Doctor, don't try to anticipate what my level of knowledge or understanding is because you are probably never going to figure it out and my questions probably aren't going to make it any easier for you to figure it out. 16:03:40 16:03:44 16:03:46 16:03:48 16:03:50

But that's not really the question at hand here. 16:03:52 16:03:52

The question is, as it stands to you, do you know whether pH has anything to do with the amount of nicotine that transfers from the cigarette tobacco into the cigarette smoke? 16:03:54 16:03:58 16:04:00 16:04:04

And I take it from your answer you do not know. 16:04:06 16:04:06

MS. WALBURN: Objection. Objection to counsel's speech, objection to the form of the question. Objection, asked and answered, and misstates the prior testimony. 16:04:10 16:04:12 16:04:12 16:04:14

THE WITNESS: When you are talking about people, which is what we are talking about here, people dependent upon nicotine -- 16:04:18 16:04:22 16:04:22

BY MR. KEMNA:

Q. Doctor, just let me interrupt for a moment. 16:04:26

A. We're talking about people --

Q. I am not talking about people here -- 16:04:28

A. You're talking about transfer of nicotine --
Q. -- I am talking about the transfer to the smoke. 16:04:30
A. -- to smoke. Then maybe you can clarify the 16:04:32
question by saying the transfer of smoke when it is 16:04:34
smoked by an FTC machine or a human being. 16:04:40
Q. However you can measure nicotine going from 16:04:44
cigarette tobacco to cigarette smoke. That's what I 16:04:46
am talking about. Not the absorption level, not how 16:04:50
an individual may actually realize that nicotine is 16:04:56
in the smoke, itself. 16:04:58
However it can be measured. It's inherent 16:05:00
in the question. 16:05:00
MS. WALBURN: Objection, asked and 16:05:02

answered. 16:05:02
THE WITNESS: And in order to give a 16:05:04
proper answer to that question, you have to put the 16:05:08
other part to it, which is under what conditions. 16:05:12
Is it from a person smoking the cigarette 16:05:14
to pull the smoke through the end of the rod, or is 16:05:18
it an FTC machine, or is it a robot? 16:05:20
I mean, you need to tell me what you 16:05:22
want -- on which condition. I can't answer that 16:05:24
except in a time frame with regard to people. Time 16:05:30
is important. 16:05:36
BY MR. KEMNA:
Q. Now, Doctor, you have talked about how nicotine is 16:05:40
absorbed in the body. Is nicotine in cigarette 16:05:44
smoke, that is mainstream cigarette smoke, absorbed 16:05:48

primarily through the alveoli in the lung? 16:05:52

A. That is the most rapid way that it gets in. It's 16:05:56
absorbed all along the tracheobronchial tree, but 16:06:06
once it reaches the alveoli, there is less layers of 16:06:12
membrane to go through, so it goes in very, very 16:06:14
quickly. And it's the speed of the absorption 16:06:16
that's -- that gives it the addictive potential. 16:06:20

Q. Now, once the cigarette smoke makes its way into the 16:06:26
individual's body through inhalation, what 16:06:30
proportion of the nicotine in the mainstream 16:06:34

cigarette smoke is absorbed in the body? 16:06:38

A. It depends. It depends upon how the cigarette is 16:06:42
smoked. It depends on the depth of inhalation, it 16:06:48
depends on the volume of inhalation, it depends on 16:06:52
the cigarette, it depends on the pH of the 16:06:54
cigarette, the pH of the cigarette smoke, it depends 16:06:58
on the filtering mechanism, the ventilation holes. 16:07:02
It depends on a whole host of things. 16:07:04
So it's not a simple -- there is not a 16:07:06
simple answer to that question. 16:07:08

Q. All right. Doctor, of the studies that have been 16:07:10
conducted to determine what percentage of nicotine 16:07:12
in cigarette smoke is absorbed by smokers, you would 16:07:16
agree, wouldn't you, that the vast majority of the 16:07:20
nicotine is, in fact, absorbed? 16:07:22

MS. WALBURN: Objection, form. 16:07:26

THE WITNESS: I -- you know, I would have 16:07:26

to see what studies you are talking about. 16:07:30

BY MR. KEMNA:

Q. Do you know of any figures that have been reported on the percentage of nicotine absorbed from cigarettes smoked through inhalation? 16:07:32 16:07:34 16:07:34

A. I am sure they have been reported but I couldn't give you one off the top of my head. I'm sure I could not -- I am sure they have been reported but I 16:07:42 16:07:44

could not give you one off the top of my head as far as a cite you want and give you an answer. I am sure they have been reported. 16:07:44 16:07:48 16:07:50

Q. You would agree that it's -- well, we can strike that. 16:07:56 16:07:56

It's been reported that approximately 90 percent of the nicotine in cigarette smoke is absorbed in the cigarette smoking process. 16:08:00 16:08:02 16:08:06

MS. WALBURN: Objection. 16:08:08

BY MR. KEMNA:

Q. Do you have reason to disagree with that? 16:08:10

MS. WALBURN: Objection to the form of the question and asked and answered. 16:08:12 16:08:14

THE WITNESS: I would have to see the report. I mean, that's -- without knowing what you are talking about, it's hard. 16:08:14 16:08:18 16:08:20

BY MR. KEMNA:

Q. So you can't cite to any values with respect to how much nicotine is absorbed from cigarette smoke? 16:08:24 16:08:32

A. Not off the top of my head. And, again, it varies 16:08:32

from company to company, cigarette to cigarette, smoker to smoker. 16:08:34 16:08:36

There are studies that have been done that have shown people smoking low-tar, low-nicotine cigarettes can really extract a lot by 16:08:36 16:08:40 16:08:40

compensating. 16:08:42

So it really depends upon the study you are talking about and the conditions it's run in and the type of cigarettes you use and all those other things. 16:08:44 16:08:48 16:08:50 16:08:50

I mean, I have patients tell me all the time, "I don't really get much nicotine in because I just puff on them a couple times and the rest of it burns up in the ashtray." I mean -- 16:08:52 16:08:54 16:08:58 16:08:58

Q. For people who inhale cigarette smoke most of it -- most of the nicotine is absorbed through inhalation? 16:09:02 16:09:06

MS. WALBURN: Objection, form. 16:09:06

THE WITNESS: It depends upon the individual, depth of inhalation, puff volume. It depends on a lot of different factors, how much they can actually extract out of a cigarette. Some can get very efficient. Some aren't. 16:09:12 16:09:16 16:09:20 16:09:22 16:09:28

BY MR. KEMNA:

Q. Are you aware of studies that have shown that nicotine can be absorbed more rapidly as a function of pH? 16:09:32 16:09:36 16:09:36

A. I am aware of one of the internal documents that 16:09:44

says that. 16:09:44

Q. Are you aware of any published literature that has referred to that concept? 16:09:48 16:09:52

A. I have an awareness but I couldn't cite you the chapter and verse, but it's well known within the scientific community that pH affects the absorption of nicotine. 16:09:56 16:09:58 16:10:04 16:10:04

And mainly, we have been talking about it in terms of pH as it relates to buccal mucosa absorption. Buccal, B-U-C-C-A-L, mucosa absorption. 16:10:08 16:10:16 16:10:20 16:10:20

And as I think I said earlier, that's been one of the more revealing things about your company's documents, is how much was known about pH and for how long it was known, which was well beyond what was in the scientific literature period. 16:10:22 16:10:24 16:10:28 16:10:30 16:10:34

So there is an article in here that speaks to the issue of how fast pH -- how fast nicotine is absorbed with pH; the higher the pH, the higher the absorption. 16:10:36 16:10:42 16:10:48 16:10:48

And it's done by a tobacco company. I mean, they showed it. 16:10:52 16:10:54

Q. Are you saying, Doctor, that information with regard to the influence of pH over buccal absorption of nicotine is not known in the outside -- the tobacco company documents? 16:10:56 16:10:58 16:11:06 16:11:08

A. No. What I tried to say, if I didn't say it clearly, was that that is where we have focused most 16:11:10 16:11:14

of our attention in the scientific literature and the scientific community because we did not know about all the pH manipulation of cigarette smoke. "We" collectively. 16:11:18 16:11:22 16:11:26 16:11:26

Q. Has it been scientifically established, in your opinion, Doctor, that nicotine as influenced by pH is more rapidly absorbed across the alveolar membranes in the lungs? 16:11:30 16:11:40 16:11:42 16:11:44

A. The higher the pH of the solution that we are talking about -- and we are talking about cigarette smoke -- the higher the pH, the higher the absorption across biologic membranes. 16:11:50 16:11:54 16:11:56 16:11:58

Q. And it's your position, Doctor -- 16:12:00

A. And -- and --

Q. -- that that's been proven with respect to the alveoli in the lungs? 16:12:04 16:12:06

MS. WALBURN: Excuse me, counsel. You are repeatedly cutting off Dr. Hurt, and I would appreciate it if you would let him continue and finish his answers. 16:12:08 16:12:10 16:12:14 16:12:16

THE WITNESS: I think that you actually said earlier when we were talking about the alveolar capillary membrane, "Is that a biological membrane?" And the answer is yes. 16:12:16 16:12:20 16:12:22 16:12:24

And if it is a biological membrane, then 16:12:28

pH would have an effect on the rapidity of the absorption of nicotine across it. 16:12:30 16:12:34

BY MR. KEMNA:

Q. Okay. So that's -- you are saying that it's been scientifically proven that pH would influence the rapidity of absorption of nicotine across the alveolar membrane into the bloodstream? 16:12:36 16:12:40 16:12:42 16:12:46

MS. WALBURN: Objection, asked and answered. 16:12:48 16:12:48

THE WITNESS: pH affects the absorption of nicotine across the biological membranes. The higher the pH, the higher the absorption, because it's in a free form. 16:12:50 16:12:52 16:12:56 16:12:58

What biological membranes have been studied or not studied is not actually the point, it is that it's a biological membrane. 16:13:00 16:13:04 16:13:08

And what -- I mean, I have only seen a few of the things from your companies but the one I am referring to says, "The effects of cigarette smoke pH on nicotine delivery and subjective evaluations. It was found that higher peak concentrations of nicotine in the blood were achieved at higher pH's." 16:13:10 16:13:12 16:13:14 16:13:18 16:13:22 16:13:26 16:13:26

That's from a Philip Morris document, number 2025988395. 16:13:30 16:13:34

So somebody has done that experiment here 16:13:38

as it relates to the general issue of biological membranes. 16:13:42 16:13:44

Now we talked earlier about the skin and there are different issues with the skin. 16:13:46 16:13:48

BY MR. KEMNA:

Q. Doctor, do you know who Neil Benowitz is? 16:13:52

A. Yes, I do. 16:13:52

Q. Do you regard Neil Benowitz as an expert in the field of nicotine pharmacology? 16:13:56 16:13:58

MS. WALBURN: Objection, form. 16:14:00

THE WITNESS: To the best of my knowledge, he is. He is a colleague. I know Neil Benowitz. 16:14:10 16:14:12

BY MR. KEMNA:

Q. Do you know that Dr. Benowitz has indicated in his publications that nicotine is very efficiently absorbed by inhalation independent of pH? 16:14:14 16:14:16 16:14:18

MS. WALBURN: Objection, form and assumes facts not in evidence. 16:14:22 16:14:24

THE WITNESS: He may have, but I -- if you have got the documents, and I can look at them -- 16:14:26 16:14:30

BY MR. KEMNA:

Q. Do you disagree with that concept, Doctor? 16:14:32

A. Well, you know, it's amazing that I think that once you get down to the alveolar capillary membrane, 16:14:34 16:14:38

it's less of a problem for the nicotine to get across that because, as we discussed, it's just two cell layers. 16:14:42 16:14:44 16:14:46

I am not aware of anyone outside of this litigation who has had the opportunity to look inside of what's been known by the tobacco industry before -- I am not sure if Neil's had the benefit of a document like this one that talks about pH in nicotine and nicotine absorption, higher peak values. 16:14:50 16:14:52 16:14:56 16:15:02 16:15:06 16:15:10 16:15:12

I am not being critical of him, I am just saying I don't know if he has had the advantage of having seen what I have seen over the last few months. 16:15:14 16:15:18 16:15:20 16:15:20

I think we all -- and that's one of the big surprises in all this to me, has been that we all have assumed that once it gets to that level that the absorption is very -- and it is, very rapid. 16:15:24 16:15:26 16:15:32 16:15:34 16:15:34

And what I have learned from you all is that you probably can make it faster -- 16:15:38 16:15:42

Q. Is that a guess?

A. -- by altering the pH. 16:15:46

Q. Is that a guess, Doctor? 16:15:46

MS. WALBURN: Objection, form, misstates 16:15:50

the testimony. 16:15:50

THE WITNESS: It is the facts that the higher the pH, the higher the free-base form of nicotine, there is more of it, and in the free-base form, it traverses biological membranes faster, and the alveolar capillary membrane is a biological 16:15:52 16:15:56 16:16:00 16:16:04 16:16:08

membrane. 16:16:10

BY MR. KEMNA:

Q. Do you know, Doctor, to a reasonable degree of medical and scientific certainty that nicotine is absorbed more rapidly as a function of pH? 16:16:12 16:16:16 16:16:24

MS. WALBURN: Asked and answered. 16:16:24

THE WITNESS: The higher the pH, the more rapid the absorption. 16:16:28 16:16:30

BY MR. KEMNA:

Q. Okay. Now, does that concept, do you know to a reasonable degree of medical and scientific certainty, apply to absorption of nicotine from cigarette smoke in the lungs? 16:16:32 16:16:34 16:16:40 16:16:42

MS. WALBURN: Objection, asked and answered. 16:16:44 16:16:44

THE WITNESS: The lungs contain a -- kind of a cascade of biological membranes. And beginning with the oropharynx, which is thicker -- oropharynx up here (indicating). And so that's all kind of 16:16:48 16:16:50 16:16:54 16:16:58

considered the respiratory tract. 16:17:00

And depending on which part of it, it will have different -- differing levels of absorption as far as the speed just because of the barriers. 16:17:04 16:17:06 16:17:08

The higher the pH in any one of those along the way would increase the rapidity with which nicotine is absorbed. 16:17:12 16:17:14 16:17:16

BY MR. KEMNA:

Q. Do you know within a reasonable degree of medical and scientific certainty whether the nicotine absorbed from cigarette smoke upon inhalation is absorbed more rapidly as a function of pH of the cigarette smoke? 16:17:18 16:17:22 16:17:28 16:17:34 16:17:36

MS. WALBURN: Objection, asked and answered now on multiple occasions. 16:17:38 16:17:40

THE WITNESS: The pH is a very important factor with how fast nicotine is absorbed across a biological membrane. The higher the pH, the more rapid the absorption. 16:17:42 16:17:48 16:17:50 16:17:52

BY MR. KEMNA:

Q. And in your opinion, that includes the alveoli in the lung? 16:17:54 16:17:54

MS. WALBURN: Objection, asked and answered on multiple occasions. 16:17:56 16:17:58

THE WITNESS: The alveoli are a biological membrane. 16:18:02 16:18:04

BY MR. KEMNA:

Q. So it's been proven to a reasonable degree of scientific and medical certainty, in your opinion, that nicotine is absorbed more rapidly across the biological membrane, the alveoli in the lung, as a function of increased pH in cigarette smoke? 16:18:08 16:18:12 16:18:16 16:18:20 16:18:22

MS. WALBURN: Objection, asked and answered on multiple occasions. 16:18:24 16:18:26

THE WITNESS: The higher the pH, the higher the absorption across biologic -- or the more 16:18:28 16:18:32

rapid the absorption is across biological membranes. 16:18:34

BY MR. KEMNA:

Q. Including the alveoli? 16:18:36

A. The alveoli capillary membrane is a biological membrane. 16:18:40

Q. So the answer is yes? 16:18:42

A. Yes. 16:18:44

Q. Doctor, are you familiar with what pH is considered physiological pH? 16:18:48

A. In what sense? Physiological in the body? 16:18:56

Q. What pH is the blood in the human body? 16:19:00

A. It actually has a fairly narrow range but it also depends upon the disease state of the body. If you 16:19:04

have kidney disease, your pH is going to be different, if you don't have kidney -- the pH will be different. If you have been hyperventilating, the pH will be different. 16:19:14

But the range is, you know, 7.35 to 7.45, as a rule, in that range, but it really depends upon the state of the body, sort of what state it's in. 16:19:22

Q. And if -- the blood stays within a fairly narrow range of pH; is that correct? 16:19:32

A. Yeah, the body goes to some extent or a lot of measures to keep it stable. That's one of the protective mechanisms. That's true, yep. 16:19:36

Q. What are those protective mechanisms called? 16:19:46

A. Oh, they are the buffering mechanisms and the kidney has the ability to add or take out the acid or basic substances depending upon what the pH is. 16:19:52 16:19:54 16:19:58

The kidney is one of the main regulators, as are the -- the lungs and the kidneys are the two main regulators of pH in the body. You can do things quickly by doing things with the lungs. 16:20:00 16:20:02 16:20:20

And so it does -- it does maintain that in a fairly narrow range by those mechanisms, by how much it -- how much hydrogen is excreted, how much salt is retained, and so on. 16:20:30 16:20:32 16:20:38 16:20:40

Q. How does a buffer act to resist changes in pH? 16:20:44

A. A buffer helps to do that just by either absorbing some of the ions that are present so it can -- buffering will -- let's see to say this simply. 16:20:48 16:20:54 16:20:58

It buffers things by having other molecules that will actually associate with either the hydrogen or negatively-charged ions and then that way it actually keeps it from coming in contact with other parts of the system. 16:21:02 16:21:06 16:21:12 16:21:16 16:21:18

And a buffer is like a -- oh, not a sponge, but it's kind of like that, it keeps it from having those ions being available to do the other things that they would normally do, like the acidic hydrogen ions, for example. 16:21:22 16:21:26 16:21:30 16:21:34 16:21:36

So there are proteins in the blood, there are all kinds of different buffering mechanisms in the blood. 16:21:42 16:21:44 16:21:44

Q. Do these buffering mechanisms apply to other areas of the body than the blood? 16:21:54

A. Uh-huh. 16:21:56

Q. Does it apply to the lung tissue? 16:21:58

A. There are -- because there is mucus in the respiratory tract, that could be -- have some buffering activities. 16:22:00 16:22:08 16:22:10

Q. Does it have buffering activity? 16:22:12

A. If that's your question. Yeah, it has buffering 16:22:16

capabilities depending on what it's exposed to. 16:22:20

Q. If it's exposed to cigarette smoke, does it have buffering capabilities with respect to the pH encountered in cigarette smoke? 16:22:24 16:22:28 16:22:30

MS. WALBURN: Objection, form. 16:22:32

THE WITNESS: Maybe you can repeat that. I am not sure I followed all the question. 16:22:36 16:22:36

MR. KEMNA: Will you repeat the question? 16:22:38

(The record was read by the court reporter.)

THE WITNESS: Well, you know, a buffer has that capability. That's what it does. I mean, it will buffer the pH so that it makes it more neutral, if you will. That's what the buffering is all about. Or the buffering mechanisms in the blood are to keep it within a relatively narrow range of pH. So it could, yeah. 16:22:56 16:22:58 16:23:02 16:23:04 16:23:08 16:23:10 16:23:12

BY MR. KEMNA:

Q. So whatever the buffer encounters it's going to attempt to normalize it to -- in the case of physiological pH in the body, 7.4 pH, correct? 16:23:16 16:23:18 16:23:22

MS. WALBURN: Objection, form. 16:23:24

THE WITNESS: It depends on what the organism is trying to do with that particular -- you know, so it's in the blood, it keeps a very narrow 16:23:26 16:23:28 16:23:32

range. But then if it's exposed to a lot of acid, for example, or a lot of lye, then it will have the buffering mechanism but then also the other mechanisms kick in as far as the kidney mechanisms and the pulmonary mechanism which will help to change the acid-base balance within the organism. So it depends on how much and which type, and so on. It's not a simple issue. 16:23:32 16:23:36 16:23:40 16:23:44 16:23:48 16:23:50 16:23:54 16:23:58 16:24:00

BY MR. KEMNA:

Q. Okay. Well, let's talk about the lung. 16:24:02

A. Uh-huh.

Q. Whatever the fluids lining the lung, the mucus that you have referred to -- which extends down the alveoli, doesn't it? 16:24:06 16:24:10 16:24:12

A. No, no. You lose -- as you go down the tracheobronchial tree you lose -- that's why it becomes a simpler membrane the further down you go. 16:24:14 16:24:18 16:24:20

So the mucus goes down -- or the mucus secreting lens, the columnar epithelium -- or the mucus secreting columnar epithelium only go down 16:24:34 16:24:38 16:24:40

partway into the tracheobronchial tree. And then as it becomes simpler, the further down that it goes, then the layers become thinner until it gets to the terminal alveoli, which

is basically one cell layer thick on both sides; one cell layer thick of lung and one cell layer thick of the capillary.

Q. Okay.

A. So it's not quite as simple -- it isn't all the way down, it will be varying from stage to stage beginning up here and going all the way down to there (indicating). I mean, it's not --

Q. Well, let's not talk about mucus specifically but there is a fluid component to, at the very least, the cellular lining of the alveoli?

A. Yeah. Actually, most cells are made up mainly of liquid. That's -- our bodies are mainly liquid to begin with.

Q. And they have --

A. So within the cells or -- is mainly water.

Q. And as a physiological fluid, albeit within the cellular lining, it has buffering capacity, doesn't it, Doctor?

A. It probably does, but I guess I would say that when you get down to that level, as far as the cellular level and their capability of buffering things, I am not sure, first of all, it's measurable.

And secondly, it would be overwhelmed if there was a very large dose of nicotine passing

through it.

I mean, it's passing through rapidly already, so any buffering that would take place once it gets to the alveolar capillary membrane would -- it would not have much of a chance to do any buffering, if that's your question.

Q. So as far as you know, then, this concept of buffering simply wouldn't operate where nicotine absorption would occur at the level of the alveoli?

MS. WALBURN: Objection, asked and answered.

THE WITNESS: I don't know that that is studyable because of what we are talking about, the terminal alveoli, and I am not aware of a study that has actually done that.

But as I said earlier, I wasn't aware of three-quarters of this stuff about pH and pH manipulation by the tobacco industry until I had the chance to look at these documents. So --

BY MR. KEMNA:

Q. Well, Doctor --

A. -- there is less awareness out there then -- so I am not sure there has been a study to do that.

Q. Doctor, we are not really talking about nicotine there specifically, we are talking about lung

physiology.

I would assume that you would acknowledge that there is a good deal known about lung physiology apart from what the tobacco industry can provide you.

MS. WALBURN: Objection to the form of the question and counsel's speech.

THE WITNESS: There is obviously a lot known about pulmonary physiology. And just as we talked earlier, when you get down to the micro, micro, micro, micro level, it's beyond the capability of anybody that I know of to be able to converse with this end, the macro level, and go all the way to the micro level of practically any field.

I am sure the same thing is true in law, but it's certainly true in medicine. And so if there has been studies of that with nicotine, I am not aware of those, but I -- if there have been studies with nicotine, I would assume that some of these documents we have seen or maybe haven't seen would get to that issue.

It certainly was an important issue as far as pH manipulation. And it's been pretty well shown that the higher the pH in these products increased

the delivery of nicotine, made it faster and, therefore, that extrapolated into sales of cigarettes. 16:28:24 16:28:28 16:28:28

It was important to one company because it made it possible for them to make more money, then the others tried to catch up. And that's the general theme through -- which is the big surprise, I mean, that's a big surprise. 16:28:30 16:28:36 16:28:38 16:28:40 16:28:42

BY MR. KEMNA:

Q. How is it specifically that they demonstrated that the nicotine is absorbed more rapidly? 16:28:44 16:28:46

A. Well, the one I just cited to you is the one that had to do with the Philip Morris document where they increased the pH and then measured the pH in the blood. I mean, measured the nicotine in the blood. 16:28:48 16:28:52 16:28:54 16:28:58

So it is an indirect measure, if you will, because it's really hard to study the alveolar capillary membrane and put a tube into the capillary; not many smokers are going to let you do that. 16:29:02 16:29:06 16:29:08 16:29:12 16:29:12

Q. Well, that's the question, Doctor. Have they actually measured -- 16:29:14 16:29:16

A. At that level? 16:29:16

Q. -- the difference in the rapidity of absorption based upon the function of pH regarding nicotine? 16:29:28 16:29:32

MS. WALBURN: Objection, asked and answered.

BY MR. KEMNA:

Q. Based on a pH environment and the effect on nicotine. 16:29:34

A. And I will quote again, "It was found that higher peak concentrations of nicotine in blood were achieved at higher pH's." 16:29:38 16:29:42 16:29:44

Q. Okay. And it's your understanding that that translates directly into saying they found that nicotine is absorbed more rapidly as a function of pH influence on nicotine in mainstream cigarette smoke? 16:29:48 16:29:50 16:29:54 16:29:58 16:29:58

MS. WALBURN: Objection, asked and answered. 16:30:00 16:30:00

THE WITNESS: They did three pH levels. And what they found was, "It was found that higher peak concentrations of nicotine in blood were achieved at higher pH's." 16:30:04 16:30:08 16:30:10 16:30:14

BY MR. KEMNA:

Q. Is that the -- 16:30:14

A. "Since the amounts of inhaled nicotine were the same, the results indicate that the higher the pH, the more rapidly nicotine enters the bloodstream." 16:30:16 16:30:20 16:30:22

Now, I don't know how much clearer it can get than that. It had to get there somewhere, and they were inhaling it. And the only difference in these subjects was the pH of the aerosol. 16:30:24 16:30:28 16:30:30 16:30:34

So would it be logical to conclude that 16:30:38

there might be a connection? These people thought so, and I would agree with them. 16:30:40 16:30:42

Q. Do you know what the surface area -- approximately what the surface area of the lung is? 16:30:46 16:30:48

A. Depends on the size of the individual. The taller the person, the bigger the surface area. My lungs would cover probably close to a half or maybe three-quarters of a football field, if you want to know that as far as a reference point; maybe more. 16:30:50 16:30:54 16:30:56 16:30:58 16:31:02

Q. All right.

A. It depends on height. Lung function and lung volume depend upon body habitus, and the taller you are, the bigger your lungs are. 16:31:04 16:31:08 16:31:10

Q. Is that important to the efficiency of absorption of nicotine in the lungs? 16:31:12 16:31:16

MS. WALBURN: Objection, form. 16:31:26

THE WITNESS: Is what? The size of the lungs? 16:31:26 16:31:28

BY MR. KEMNA:

Q. The surface area of the lungs in terms of the absorptive surface of the alveoli. 16:31:32 16:31:32

A. I think that probably, and I guess I don't know if I have ever seen this studied in this way. The surface area of the lungs is so large that even a puff volume of -- even my puff volume, which is -- I told you earlier I could smoke the first cigarette of the day with three puffs. Even that would not overwhelm the surface area of my lungs. 16:31:34 16:31:36 16:31:40 16:31:44 16:31:46 16:31:50 16:31:52

So if the aerosol gets down to the alveolar capillary membrane, that's the important part. 16:31:56 16:31:58 16:32:00

And so it would be fairly evenly distributed until it was all absorbed, and so -- 16:32:02 16:32:06

Q. Right. 16:32:06

A. -- the bigger the lungs, the more rapid the absorption. I don't -- I think that the lungs are already very, very large as far as their capacity is to begin with, and I am not sure that it would make any difference. 16:32:08 16:32:12 16:32:14 16:32:18 16:32:26

I mean, it's just -- you are talking about orders of magnitude. If you are talking about a surface area that's the size of a half a football field compared to a puff volume -- half a football field or depending upon the size of the individual, and a puff volume that's no bigger than this (indicating) -- I mean, it's -- it's irrelevant 16:32:28 16:32:30 16:32:36 16:32:36 16:32:38 16:32:42 16:32:46

because it will be absorbed so rapidly because you have so much surface area for it to be absorbed in. 16:32:48 16:32:54

Now, if the surface area and the puff volume was the same, then you might -- that might -- that might be an issue. 16:32:56 16:32:58 16:33:00

And we actually have patients that that happens to. And I am not sure I have ever seen this reported in people with obstructive lung disease or emphysema, but as they begin to lose pulmonary 16:33:02 16:33:04 16:33:10 16:33:14

function, as their alveoli -- lose pulmonary function, lose these little alveoli, I still think that the reserve that they have is larger than the puff volume might be. 16:33:14 16:33:18 16:33:22 16:33:26

And this is a generous puff volume, that would be twice the usual. 16:33:28 16:33:30

Q. Okay. Now -- 16:33:32

MS. WALBURN: Excuse me, counsel. Anytime you are ready to take a break, I think we are coming up on that time. 16:33:34 16:33:36 16:33:36

MR. McDONNELL: Roberta, can I ask a question on the record before the break? 16:33:42 16:33:44

Could you tell U.S. what the status of that notebook that Dr. Hurt is referring to is? 16:33:46 16:33:50

MS. WALBURN: The notebook of documents? 16:33:54

MR. McDONNELL: Yes. 16:33:54

MS. WALBURN: The status of it? 16:33:56

MR. McDONNELL: Well, what is it? He has referred to it repeatedly. I assumed it was just a compilation of the documents that have already been brought to our attention, but he twice referred to a Philip Morris document, identified it by Bates Number, and it's not on the list of documents that have been disclosed to U.S.. 16:33:58 16:34:02 16:34:04 16:34:06 16:34:10 16:34:12 16:34:14

MS. WALBURN: Well, these are documents from the document depositories in this litigation, and unless our law firm made a mistake, every document in this book has been identified to defense 16:34:16 16:34:20 16:34:24 16:34:28

counsel by Bates Number. 16:34:28
MR. McDONNELL: Well, I guess I am 16:34:30
suggesting your law firm made a mistake because I 16:34:34
have the documents in which you have made disclosure 16:34:36
here. The document -- the Bates Number of the 16:34:38
document that Dr. Hurt referred to twice is 16:34:42
2025988395. 16:34:48
THE WITNESS: Uh-huh. 16:34:48
MR. McDONNELL: And I have checked as I 16:34:52
sat here all of the documents that disclosed Bates 16:34:54
Numbers that I know and it's not among them. And it 16:34:58
raises for me the question what is in that 16:35:00
notebook? And it seems to me -- excuse me, it seems 16:35:04

to me that we are entitled to at least a statement 16:35:06
from you about what's in that notebook, if not to 16:35:08
examine it ourselves. 16:35:10
MS. WALBURN: You can look at the notebook 16:35:12
if you would like at a break. 16:35:14
MR. WILSON: Are you sure you have the 16:35:16
updated letters which we sent? I think your 16:35:18
co-counsel referred to them earlier. 16:35:20
MR. McDONNELL: I don't have -- I am 16:35:22
sorry. I don't know what you mean by "co-counsel." 16:35:24
MR. WILSON: We have supplemented the list 16:35:24
that I believe you may be referring to. 16:35:26
MR. McDONNELL: Well, I have a list and I 16:35:28
have two supplements. 16:35:30

MS. WALBURN: Well, again, the document should have been identified on the list. 16:35:32 16:35:34

MR. McDONNELL: I know that. 16:35:36

MS. WALBURN: If it's not, it's our firm's error. But I think it has been. In any event, these are documents that have all been produced in this litigation. You are welcome to look through the notebook. 16:35:38 16:35:40 16:35:42 16:35:44 16:35:46

MR. PURDY: Let me just make a suggestion. Why don't we mark that as the next exhibit and get it copied. 16:35:48 16:35:50

MR. McDONNELL: Great idea.

MR. PURDY: You don't have to do it now. But just mark it now and we'll have it copied. I'd appreciate that. 16:35:56 16:35:56

Give it the next number, please. 16:36:00

(Defendants' Deposition Exhibit 2455 was marked for identification and a discussion was held off the record.) 16:36:06

MR. McDONNELL: Back on the record. I just -- I want to make it plain that I don't know how -- how many documents that were supposed to be predesignated may not have been. 16:36:38 16:36:40 16:36:42 16:36:44

But if -- I mean, this is a significant document, and if I have not had an opportunity to prepare on it, I am going to ask Dr. Hurt to come back for another visit with U.S. 16:36:50 16:36:52 16:36:54 16:36:56

MS. WALBURN: Yeah, well, you can do 16:36:58

whatever you want, it's your client's document; you have had it for years. And I think it's a two-page document, and I would suggest that you familiarize yourself overnight with it so you are prepared to ask any questions you would like tomorrow. 16:37:00 16:37:02 16:37:04 16:37:06 16:37:08

MR. McDONNELL: Well, if counsel thinks that reading a two-page document is all it takes to familiarize herself with the documents, she is 16:37:10 16:37:14 16:37:18

mistaken, but we will stand on our respective positions. 16:37:22 16:37:24

MR. LOSS: I would also request that we get a copy of the binder before we leave today, given your comments that you just made on the record. 16:37:28 16:37:30 16:37:34 16:37:34

MS. WALBURN: Well, I think we will give you the Bates numbers before you leave, if you want to sit here and list the Bates numbers, and we will get you a copy of the notebook as soon as we can. 16:37:36 16:37:38 16:37:40 16:37:44

They are all documents that you have, they have been disclosed to the best of our knowledge, and I would appreciate moving on with the deposition. 16:37:46 16:37:50 16:37:50 16:37:52

MR. LOSS: Well, I am in Minnesota right now and not New York and it's not going to be feasible for me to get the documents if there are any in there that I need to see, so either you make a copy for U.S. or we take the doctor's binder. 16:37:56 16:37:58 16:38:02 16:38:04 16:38:06

MS. WALBURN: Well, I appreciate your --

MR. LOSS: I see that as the only option. 16:38:08

MS. WALBURN: Yeah, I appreciate your 16:38:10

threats, counsel, but you have all the documents. 16:38:12

In fact, it was your co-counsel -- and I think you 16:38:16

know what that term means -- who predesignated all 16:38:18

the documents that were listed in Dr. Hurt's report 16:38:20

and attachments, so you had fair notice. 16:38:24

You, yourselves, gave yourselves notice of 16:38:26

what documents might be here today. So I assume 16:38:28

that you come to these documents well prepared. 16:38:30

Can we proceed with the deposition? 16:38:32

MR. LOSS: I just want to, for the record, 16:38:34

join Alf McDonnell in my objection. 16:38:38

MS. WALBURN: Well, you can -- I assume 16:38:38

that you all join. Okay? So I'm just assuming that

you all join the objection.

Let's proceed. 16:38:44

Okay. Take a break.

VIDEOGRAPHER: Temporarily going off the 16:38:48

video record. The time is now 4:38 p.m. 16:38:56

(A recess was taken.)

VIDEOGRAPHER: We are back on the video 16:53:46

record. This is the fourth tape in the videotaped 16:53:48

testimony of Richard Hurt. The time is now 16:53:52

4:53 p.m. 16:53:54

MR. McDONNELL: Over the break I 16:53:56

discovered that I was in error and that the exhibit 16:54:00

that Dr. Hurt referred to had, in fact, been predesignated in a supplemental letter. I missed it when I went by it during the

deposition. Ms. Walburn has asked me to apologize on the record and I am happy to do so.

I think the issue that we have raised with respect to the notebook remains and may be the subject of further discussion, but that's all I have to say.

MS. WALBURN: Thank you. Let's proceed.

BY MR. KEMNA:

Q. Doctor, are you aware of any empirical evidence supporting the idea that the pH of mainstream cigarette smoke can influence the rapidity of the distribution of nicotine as absorbed in the lungs, the rapidity of that distribution of that nicotine to the brain?

MS. WALBURN: Objection, form.

THE WITNESS: That was a long question so maybe you can hone it just a little bit for me.

BY MR. KEMNA:

Q. You would agree that nicotine is absorbed through the lungs into the bloodstream; is that correct, Doctor?

A. Nicotine is absorbed all along the -- from the time it enters the mouth and begins to be absorbed and it's absorbed at varying degrees all the way down to

the terminal alveoli, as far as smoke -- cigarette

smoke-delivered nicotine.

Q. Is there any empirical evidence that cigarette smoke, as absorbed in those various parts of the respiratory system, is distributed more rapidly to the brain as a function of the pH of the mainstream cigarette smoke?

MS. WALBURN: Objection, form.

THE WITNESS: Just give me what your definition of "empiric data" is. I mean, it means different things to different people.

BY MR. KEMNA:

Q. Okay. Let's state the question this way. Same question with regard to any scientific evidence.

A. "Scientific evidence" meaning published literature or internal document literature?

Q. What you would regard as appropriate scientific evidence to rely upon for stating an expert opinion.

A. We know that the higher -- and I have said this before, the higher the pH, the higher the absorption of nicotine.

We know that when you look at the arterial levels of nicotine compared to the venous levels, there is a difference in those levels because the absorption is very rapid through the lungs.

And as I have said earlier, the surprise to me was to find so much emphasis on pH in the documents, such as this one says, "Still, with an old-styled filter any desirable additional nicotine kick could be easily obtained through pH regulation." 16:57:24 16:57:30 16:57:34 16:57:38 16:57:42 16:57:42

Now, if "kick" means what happens to the brain, then this author, Frank Colby, was talking about this in 1973. 16:57:46 16:57:54 16:57:58

If we are talking about how the impact of nicotine on the brain and how it might be altered with pH, there is another one from R.J. Reynolds, dated September 8 -- R.J. Reynolds, September 8, 1980, number 501522720, which says, "Nicotine satisfaction" -- I think which is a euphemism for what the addictive potential of nicotine is -- is dependent upon what I said earlier, it's dependent on a lot of things; puff count, puff volume, T/N ratio, total nicotine delivery, nicotine delivery per puff, plus free nicotine per puff. 16:58:04 16:58:06 16:58:14 16:58:14 16:58:22 16:58:26 16:58:30 16:58:34 16:58:42 16:58:48 16:58:54

The latter, in turn, is related to nicotine delivery per puff and smoke pH. 16:59:00 16:59:06

The higher the pH, the higher the absorption. And at the bottom, "The percent free nicotine depends on the smoke pH." And we have 16:59:08 16:59:10 16:59:12

already talked about free nicotine is absorbed more rapidly than -- free-base nicotine is absorbed more rapidly than the salt form. 16:59:16 16:59:22 16:59:24

And that's what it says, "Free nicotine is absorbed more rapidly by the smoker than is bound nicotine." 16:59:30 16:59:34 16:59:36

And so that's a long answer to your question, but this is at least some of the information, the empiric information available to me that I wasn't aware of before, and it's pretty old. 16:59:40 16:59:44 16:59:48 16:59:56

Q. So are you saying that it has been demonstrated scientifically that nicotine is delivered more rapidly to the brain as a function of the pH of mainstream cigarette smoke? 17:00:00 17:00:02 17:00:06 17:00:08

MS. WALBURN: Objection, asked and answered. 17:00:10 17:00:10

THE WITNESS: If nicotine is absorbed more rapidly across a biologic membrane because of the higher pH, it gets into the system, into the bloodstream faster and it is delivered to the brain faster. 17:00:12 17:00:14 17:00:18 17:00:20 17:00:22

If it's delivered across the biologic membrane faster, it reaches the brain faster. If you put it on -- put it in a nicotine nasal spray, which is a very slow absorption compared to the 17:00:24 17:00:28 17:00:30 17:00:34

cigarette, it's absorbed through the lining of the nose into the venous circulation and it circulates all around, gets mixed in with the total blood 17:00:36 17:00:38 17:00:42

volume, and then it ends up coming back to the heart, pumped to the lungs, pumped to the left side of the heart, and then it goes to the brain; it's a very slow delivery form. 17:00:44 17:00:46 17:00:50 17:00:52

If you have it entering into the lungs, rapidly absorbed across the alveolar capillary membrane into the pulmonary circulation, it goes to the left side of the heart and within a few heartbeats it's at the brain. 17:00:54 17:00:56 17:01:00 17:01:02 17:01:06

And the levels are extraordinarily high compared to the venous levels that we see in people. 17:01:08 17:01:10 17:01:12

So if pH increases the absorption across the biological membrane and causes the more rapid absorption, then the faster it's absorbed the faster it has a chance to get to the brain, correct. 17:01:16 17:01:20 17:01:24 17:01:26

BY MR. KEMNA:

Q. Okay. So you are saying that it is scientifically demonstrated that the nicotine is more rapidly absorbed across the alveolar membrane as a function of pH; is that correct? 17:01:32 17:01:34 17:01:38 17:01:40

MS. WALBURN: Objection, asked and 17:01:42

answered on multiple occasions. 17:01:42

THE WITNESS: What I have said is that nicotine -- the pH of the medium, the nicotine, is an influence on the rapidity of the absorption across biological membranes. The higher the pH, the 17:01:44 17:01:50 17:01:52 17:01:56

higher the absorption. 17:01:58

And I haven't seen all of your documents 17:02:00

to know if someone has gotten this down to the 17:02:02

alveolar capillary membrane, but it is higher 17:02:08

absorption across the biological membrane with a 17:02:12

higher pH. The faster -- the higher the pH, the 17:02:16

more rapidly it traverses. 17:02:18

BY MR. KEMNA:

Q. So you don't know whether it's been demonstrated at 17:02:20

the level of the alveoli with regard to the key 17:02:22

question of whether there is a more rapid absorption 17:02:24

by virtue of a change in the pH of the mainstream 17:02:30

cigarette smoke? 17:02:32

MS. WALBURN: Objection to the form of the 17:02:34

question. Objection, asked and answered and 17:02:36

objection, misstates the prior testimony. 17:02:38

THE WITNESS: What I have said is that the 17:02:42

pH is a factor in the absorption of nicotine across 17:02:46

biological membranes; the higher the pH, the higher 17:02:50

the absorption. 17:02:52

The alveolar capillary membrane is a 17:02:54

biological membrane. 17:03:00

BY MR. KEMNA:

Q. So your answer to the question is yes? 17:03:00

A. Yes. 17:03:02

MS. WALBURN: Well, objection. I don't 17:03:04

even know what the question is. 17:03:04

MR. KEMNA: He answered the question. 17:03:06

MS. WALBURN: Well, counsel, I appreciate your letting me raise an objection. I don't know what the question is. 17:03:08 17:03:12 17:03:12

MR. KEMNA: Well, that's not the problem. The witness apparently knew what the question was. 17:03:14 17:03:16

MS. WALBURN: The problem is -- well, I don't think that the record is going to reflect that, and so I am going to ask that the question be phrased to what you want an answer. 17:03:18 17:03:20 17:03:22 17:03:24

BY MR. KEMNA:

Q. Doctor, are you familiar with any possible use that the tobacco companies may have had for ammonia-containing substances or ammonia compounds other than what you have referred to today? 17:03:30 17:03:32 17:03:38 17:03:42

A. They talk in terms of using it for flavor, I think is one of the other things I recall from the documents. 17:03:56 17:03:58 17:04:00

But they sure use a lot of it. In one of the documents it talks about 900,000 pounds of ammonia being released in emissions in North Carolina alone, and the equivalent of ammonia being consumed by the tobacco industry, the equivalent of 10 milligrams of ammonia per cigarette, so that's a lot. 17:04:02 17:04:08 17:04:10 17:04:14 17:04:18 17:04:20 17:04:22

So there may be other -- they have talked about using it as a, quote, "flavoring," but there may be other things that -- but the bulk of the 17:04:24 17:04:26 17:04:34

evidence and the theme here has been to use ammonia technology for the manipulation of nicotine. That's what comes through here. 17:04:42 17:04:44 17:04:46

There may have been other things, flavor was one thing I can recall. But they used a lot of it, a lot of ammonia. 17:04:48 17:04:50 17:04:52

Q. Regardless of, you know, the question, I guess, in your mind as to how much they use and what that relates to in terms of the cigarette product, you haven't made an attempt to evaluate whether they have an independent reason for the use of ammonia in their products apart from the pH factor that you referred to? 17:04:54 17:04:56 17:04:58 17:05:00 17:05:02 17:05:06 17:05:06

MS. WALBURN: Objection, form, asked and answered. 17:05:10 17:05:10

THE WITNESS: The use of ammonia as described in these documents -- and it's not just one, it's multiple different documents from multiple different companies. The use of ammonia has been focused on nicotine delivery and the rapidity with which nicotine could be delivered. 17:05:16 17:05:18 17:05:22 17:05:26 17:05:32 17:05:34

And as I said, there are other things that have been mentioned that I recall seeing, but I couldn't give you a specific. 17:05:36 17:05:38 17:05:40

Flavor is something I recall, but, you know, I think all of U.S. know that nicotine itself doesn't taste very good so some of the flavoring may just be used to make it so the nicotine is 17:05:44 17:05:48 17:05:52 17:05:54

palatable. But flavoring is one thing I remember, but that's -- there may be others. I just -- I couldn't tell you. 17:05:56 17:06:00 17:06:02

BY MR. KEMNA:

Q. Are you aware of anything else in cigarette products that may influence pH one direction or the other? 17:06:06 17:06:10

A. As we talked earlier, I mean, I -- there are -- there is a void in the public knowledge about what actually is added to your product. 17:06:22 17:06:26 17:06:30

Q. I am asking about your knowledge, Doctor. 17:06:32

A. I haven't reviewed the class 2 documents as yet, but at some point I will, between now and probably the 17:06:38 17:06:40

trial. So I couldn't really tell you firsthand about what you are asking. 17:06:44 17:06:46

There are lots of different things that are added but I don't know what they all are because I haven't reviewed the documents relating to that. 17:06:50 17:06:52 17:06:56

Q. Doctor, do you know what the definition of the term "impact" is? 17:07:00 17:07:02

MS. WALBURN: Objection, form. 17:07:04

THE WITNESS: I guess whose definition? 17:07:08

BY MR. KEMNA:

Q. Well, let's pick whatever definition you are familiar with at this point. 17:07:10 17:07:12

A. Well, I mean, whose definition? 17:07:14

Q. Let's talk about yours. 17:07:14

A. My definition? "Impact," to me, has probably two 17:07:20

meanings. And "impact" to me has to do with what happens when the initial intake of cigarette smoke occurs, and I think the industry documents talk a bit about that, as far as what happens in the back of the throat and so on. That's one thing that's mentioned here, and that does happen. 17:07:26 17:07:28 17:07:32 17:07:36 17:07:40 17:07:42

Depending upon which cigarette it is will determine how much of a sensation that you have on the back of the throat. That's kind of what they term "impact." 17:07:46 17:07:50 17:07:52 17:07:56

The real impact, though, is the impact that nicotine has on the brain, and that is the impact that's important. 17:07:58 17:08:02 17:08:04

And so when I talk to patients and we talk in terms of "impact," they talk to me in terms of what this did to their brains. 17:08:08 17:08:12 17:08:14

So we can talk about what it does to the back of the throat, but it's really trivial compared to what the nicotine levels do in the brain. And that's what people talk about, the hit, if you will. "Hit" and "impact" are basically the same. 17:08:16 17:08:20 17:08:22 17:08:24 17:08:28

Q. Well, Doctor, do you know how much the concept of impact as the industry uses -- that is the sensation at the back of the throat has to do with the consumer's satisfaction with the particular cigarette product? 17:08:30 17:08:34 17:08:38 17:08:40 17:08:44

MS. WALBURN: Objection, form. 17:08:46

THE WITNESS: I think different companies 17:08:48

have defined that differently and they have obviously tried to modify their products in different ways, and some have gotten better than others; some companies have been more successful than others in doing this. 17:08:50 17:08:52 17:08:54 17:08:58 17:08:58

Really the most successful ones, though, have been the ones that have delivered the highest 17:09:02 17:09:04

levels of nicotine to the person. And that has to do with pH manipulation because Philip Morris, Marlboro, is the most successful brand and the rest of you have been trying to catch up with them for the last I don't know how long. 17:09:06 17:09:10 17:09:14 17:09:16 17:09:18

BY MR. KEMNA:

Q. Well, Doctor --

A. And they manipulated nicotine for a long time using pH and using ammonia. 17:09:22 17:09:24

Q. Well, Doctor, do you know for a fact that consumer acceptance of a product like Marlboro has perhaps more to do with the throat sensation versus this idea of increased absorption of nicotine? 17:09:28 17:09:30 17:09:36 17:09:38

MS. WALBURN: Objection, misstates the testimony, and form. 17:09:42 17:09:42

THE WITNESS: There may be some things reported in these tobacco industry documents that talk about that, but the facts are the patients that I deal with, who are dying from this problem because they continue to smoke, smoke because of nicotine. 17:09:44 17:09:48 17:09:52 17:09:54 17:09:58

Nicotine is the drug that's being delivered to their brains that causes the whole cascade of pleasure and reward that makes them continue to use, despite having all these horrific medical complications. 17:10:00 17:10:02 17:10:06 17:10:12 17:10:12

They don't come in and talk to me about what happens at the back of their throat, because many of them can't breathe well enough to get anything through the back of their throat. 17:10:16 17:10:20 17:10:22 17:10:24

So they talk to me about what the impact is on their brain. What the "hit" is, is a commonly-used term used by the patients. 17:10:26 17:10:28 17:10:30

So that's all I can say. 17:10:32

BY MR. KEMNA:

Q. Yeah, Doctor, I understand your clinical experience. And my questions really don't relate to what your patients' perception is of this whole behavior of smoking, but rather your representations regarding the intent of the industry from a review of documents as to why they use a particular substance in the manufacture of their product. 17:10:32 17:10:34 17:10:42 17:10:44 17:10:48 17:10:50 17:10:54

Do you know what the motivation of the tobacco industry is for the use of ammonia and ammonia compounds in the production of cigarette products? 17:10:58 17:11:06 17:11:08 17:11:08

A. Well, I think I have already answered this. I mean, just from -- from the documents I have talked to you about as far as the one use of ammonia is to 17:11:14 17:11:16 17:11:20

increase the delivery of nicotine. 17:11:22

And though you may say it's irrelevant 17:11:24

about my clinical experience, it absolutely is 17:11:28
relevant because my patients are also consumers and 17:11:32
customers. And so you are talking about that as 17:11:34
a -- kind of a side issue. It's not a side issue at 17:11:38
all. 17:11:38

But what the documents say is that the 17:11:40
higher the pH, the higher the absorption, the 17:11:44
more -- more free-base nicotine that's delivered, 17:11:48
and that has to do with the addictive potential and 17:11:52
that has to do with why my patients and smokers 17:11:56
continue to smoke. 17:11:56

Q. Now, Doctor, first off, I made no comment regarding 17:12:00
the relevance of your patients' reports of whatever 17:12:02
their experience is with cigarette smoking, and 17:12:06
certainly with respect to your clinical practice, I 17:12:10
am not going to take any position about the 17:12:16
relevance of -- 17:12:18

A. I guess --

Q. -- regarding the relevance of, you know, this type 17:12:18
of comment to you in the treatment side. 17:12:20

A. Maybe if you wouldn't mind, because I would like to 17:12:24
clarify that. 17:12:24

I would like for her to reread the 17:12:26
question because -- 17:12:28

Q. If it's important we can go back. 17:12:30

A. I think it is important. 17:12:32
Q. We can go back and look at it, but I am going to move on at this point. 17:12:36
A. You won't reread the question? 17:12:38
Q. No, it's really not important to go back. The record stands for what it is. 17:12:42
You would agree, Doctor, that -- and this is consistent with a prior answer to a question -- that when the documents refer to something by the term "impact," the tobacco industry's definition for the word "impact" relates to the sensation at the back of the throat? 17:12:48
MS. WALBURN: Objection, misstates prior testimony and asked and answered. 17:13:04
THE WITNESS: I have seen some documents that talk about impact, as far as that sensation. 17:13:06
Whether that is a tobacco industry definition, I have not seen that written here, nor have I seen anything publicly stated that all the companies agree that impact has to do with the back of the throat. Is that what you are asking? 17:13:14
BY MR. KEMNA:
Q. Well, to the extent that you have reviewed documents so far -- 17:13:32
A. Well, you have asked me to give a tobacco industry 17:13:34

definition, and I would have to ask you all if there is one. I don't know that there is one. I have seen documents that say something about impact as far as the back of the throat. 17:13:38 17:13:42 17:13:44 17:13:44

What you asked me originally was, what is my definition of impact, and that's what I told you about. 17:13:46 17:13:50 17:13:52

It has to do with this, but more importantly it has to do with the hit of nicotine in the brain and what it does to the brain. That's what keeps people smoking. People don't continue to smoke because of what it does to the back of their throat. 17:13:54 17:13:56 17:13:58 17:14:00 17:14:04 17:14:04

Q. I understood your response, Doctor, and I am specifically referring to your understanding of the use of the use of the word "impact" as it was perceived by you in reviewing the documents. 17:14:06 17:14:08 17:14:12 17:14:14

A. But you also asked about a tobacco industry definition, and I didn't see a tobacco industry definition for all of you. Maybe there is one, but I didn't see one in these documents, anyway. 17:14:16 17:14:20 17:14:24 17:14:48

And, you know, the other thing I just read to you about kick -- 17:14:50 17:14:52

Q. Doctor, there is no question pending. 17:14:54

A. Oh, thank you. Just an extraneous thought. 17:14:56

Q. Doctor, do you know what the pH range is for a 17:15:22

product like cigars? 17:15:24

A. I know what's written here. It's higher than the pH of the cigarettes if you -- it's on this one chart we talked about earlier that has cigars on there. Big -- I don't know what "big cigar" is, but big cigar has a pH of greater than 8. 17:15:32 17:15:38 17:15:40 17:15:44 17:15:48

I think it depends on -- depends on what the cigar manufacturers add to their cigars, which I don't know what all they add. So the pH is higher in cigars, at least from what's contained here. And what our clinical understanding about cigars has been is that the pH has been higher because it's not necessarily -- necessary to inhale cigar smoke in order to get the absorption of nicotine. 17:15:50 17:15:52 17:15:56 17:15:58 17:16:02 17:16:06 17:16:10 17:16:12

Same thing is true of pipe smoke. 17:16:14

Q. Is it more difficult to inhale smoke at a higher pH? 17:16:16 17:16:16

MS. WALBURN: Objection, form. 17:16:20

THE WITNESS: It depends on the individual, obviously. I -- same sort of issue as far as pipe tobacco has a higher pH, and I was able to do that, and I really got a kick and a hit out of pipe tobacco smoke in a way that I have never had the lights turned on quite like that. 17:16:28 17:16:30 17:16:32 17:16:36 17:16:42 17:16:44

So it is possible to inhale smoke with higher pH's because people do it all the time. In fact, a lot of our cigar smokers and pipe smokers do it regularly. 17:16:48 17:16:54 17:16:58 17:17:14

BY MR. KEMNA:

Q. Relatively speaking, would you consider it more difficult to inhale smoke from a higher pH smoke above, say, a pH of 8 versus the range of pH that applies to cigarette mainstream smoke? 17:17:18 17:17:22 17:17:28 17:17:30

A. Oh, I think again it depends on the individual. I don't know what the pH of Marlboros were when I was smoking them because it probably changed. I could actually look back at one of these charts and probably figure that out because they have some pH levels of Marlboros from the '60s. 17:17:36 17:17:40 17:17:42 17:17:44 17:17:46 17:17:50

It had a different quality to it as far as pipe smoke and cigar smoke. 17:17:54 17:17:56

Q. So in general, it doesn't make any difference as far as you are concerned? 17:18:00 17:18:00

A. I think it depends on the individual. It's not going to make any difference. It depends on the individual. I think that as the pH goes up, it does affect other things. 17:18:02 17:18:06 17:18:08 17:18:10

Maybe probably it is more harsh, if you think about it in terms of harshness. But for 17:18:12 17:18:14

really heavy smokers like I was -- I mean, I was already smoking three packs a day, two, three packs a day. 17:18:18 17:18:20 17:18:22

And then to add a smoke that I didn't know at that time had a higher pH, it really wasn't what ended up happening in here that was important, it 17:18:24 17:18:30 17:18:32

really was what was ending up happening up here that was the major importance (indicating). 17:18:36

So I think it's -- the driving factor still goes back to nicotine as the main force behind the continued behavior. 17:18:38 17:18:42 17:18:50

Q. This free-base form of nicotine that you have referred to -- 17:20:04 17:20:06

A. Uh-huh. 17:20:08

Q. Is that in the ionized or unionized form? 17:20:12

A. Free base would be where the hydrogen ions are no longer attached to the molecule, so that is the form that passes most freely across the biological membranes because it's not encumbered by those -- or salts, too, if that answers your question. 17:20:16 17:20:20 17:20:24 17:20:28 17:20:32

Q. So it's unionized? 17:20:34

A. It doesn't have the hydrogen ions on it as far as the passage -- when it becomes a free base then the hydrogen ions go away. That's what makes it into a free base. 17:20:38 17:20:42 17:20:46 17:20:46

Q. Does it have a net electrical charge to it, then? 17:20:50

A. I have to think about that a little bit. I think that the taking off the hydrogen ions would then make the electrical charge be less, and that's probably one reason it passes by more easily through the biological membranes. 17:20:56 17:20:58 17:21:02 17:21:06 17:21:08

So it would be less of an electrical charge because, remember, you have removed two hydrogen ions. 17:21:08 17:21:12 17:21:12

Q. Does the -- let me ask you this question: At a pH of 7.4 in the blood -- 17:21:32 17:21:34
A. Uh-huh. 17:21:36
Q. -- is there only one balance of free-base nicotine to -- 17:21:40 17:21:42
A. Only one -- one what? I didn't understand what you said. 17:21:44 17:21:44
Q. Balance of the proportion of free-base nicotine to ionized nicotine? 17:21:48 17:21:54
MS. WALBURN: Objection, form. 17:21:56
THE WITNESS: I don't know what you mean. Balance and -- just -- you need to explain it more. 17:21:58 17:22:02
BY MR. KEMNA:
Q. Let's talk about how you figure out whether you have more or less free-base nicotine within some particular pH environment. 17:22:04 17:22:10 17:22:14

If you have a pH of 7.4 -- 17:22:16
A. Uh-huh.
Q. -- and the laws of acid-base chemistry apply, on a percentage basis you are going to have a certain percentage of the nicotine in an unbound or free form and a certain percentage in a bound or ionized form; is that correct? 17:22:22 17:22:24 17:22:28 17:22:32 17:22:32
MS. WALBURN: Objection, form. 17:22:36
THE WITNESS: Well, if -- I think the answer is correct but it has to do with the medium that it's in as far as the pH is concerned, would 17:22:38 17:22:42 17:22:46

determine what that is. 17:22:48

So if you had a very large percentage of 17:22:52

the -- the nicotine being transferred in because 17:22:58

it's been treated with ammonia to begin with and 17:23:00

it's already in the free-base form, when it gets 17:23:02

into the lungs the volume of blood is relatively 17:23:06

small compared to the total blood volume and the 17:23:08

concentrations are very high, and it only takes a 17:23:12

couple or three heartbeats to get from here to here 17:23:16

(indicating). 17:23:18

So the buffering mechanism in the blood, 17:23:22

much like the alveoli we talked about earlier as far 17:23:26

as being kind of overwhelmed by this jolt of 17:23:30

nicotine, that would probably be operational there 17:23:32

but I am not sure it would have time to do what you 17:23:36

are suggesting. 17:23:38

BY MR. KEMNA:

Q. So in your opinion, the buffering capacity of the 17:23:40

blood might well be overwhelmed in that you would 17:23:44

see some unbalanced level of, say, free-base 17:23:52

nicotine make its way to the brain before the blood 17:23:56

buffering capacity had an opportunity to act on it? 17:23:58

MS. WALBURN: Objection, asked and 17:24:00

answered, form of the question. 17:24:06

THE WITNESS: And it would take a very 17:24:08

exotic experiment to prove all that. 17:24:10

But the theory of the buffering mechanism 17:24:14

and how fast it can act -- I mean, there is a finite 17:24:18

rapidity with which it can act. 17:24:20

And if you have a very high level of 17:24:22

nicotine that's introduced and you are only three or 17:24:26

four heartbeats away from the brain, there probably 17:24:30

is -- if it goes across the membrane in a free-base 17:24:34

form, there would be some that would reach the brain 17:24:38

in that form, correct. 17:24:44

BY MR. KEMNA:

Q. Is that your theory or is that scientific fact? 17:24:46

MS. WALBURN: Objection to the form of the 17:24:48

question. 17:24:48

THE WITNESS: The facts are that the 17:24:52

higher the pH, the higher the absorption. The 17:24:56

higher absorption across the biologic membrane has 17:25:00

to do with the free state of nicotine which has to 17:25:04

do with the pH. 17:25:06

The higher the levels that are introduced 17:25:08

into the pulmonary bloodstream, because it's a 17:25:12

relatively small volume compared to the whole volume 17:25:16

of blood, makes the concentrations and the arterial 17:25:18

concentrations very high. 17:25:22

It goes from the lungs to the pulmonary 17:25:24

vein to the heart to the carotids, and it does that 17:25:30

very, very quickly. 17:25:34

BY MR. KEMNA:

Q. How would you prove that, in fact, the blood did not 17:25:36

have an opportunity to act as a buffer as against 17:25:40

the amount of unprotonated nicotine which as you described it making its way into the bloodstream? 17:25:44 17:25:48

MS. WALBURN: Objection, form. 17:25:50

THE WITNESS: How would I prove that? 17:25:52

BY MR. KEMNA:

Q. Uh-huh. 17:25:52

A. It would take a very exotic experiment and we don't always do that in medicine, if you are putting people in jeopardy to do the experiment. 17:25:56 17:25:58 17:26:00

Q. So it hasn't been done? 17:26:02

MS. WALBURN: Objection, form. 17:26:04

THE WITNESS: To my knowledge, the pH question is probably more well understood and more studied by your companies than anybody else in the world, unbeknownst to me before I had the chance to review these documents. 17:26:08 17:26:14 17:26:20 17:26:24 17:26:26

And the '94 document we referred to before the break has to do with giving aerosolized nicotine to smokers and measuring their blood levels. And it clearly shows that the higher the pH of the inhaled nicotine, the higher the blood levels. 17:26:30 17:26:34 17:26:38 17:26:42 17:26:44

Now, what else has been done within the tobacco industry, I don't know. 17:26:48 17:27:00

BY MR. KEMNA:

Q. Doctor, do you know or have you been informed that Dr. Neil Benowitz has been listed as an expert in smoking and health litigation? 17:27:04 17:27:08 17:27:12

A. I am not sure what you mean, "listed as an expert." 17:27:16

He is a good guy. I have known him for a long time. But I don't know what you mean by "listed as a" -- 17:27:18 17:27:20 17:27:20

Q. He has been listed by the plaintiffs in the litigation as against the tobacco companies filed by one or more attorney generals of the respective 17:27:24 17:27:26 17:27:30

states that have lawsuits pending. 17:27:34

A. I guess I was aware that he was involved but I am not sure to what extent. 17:27:38 17:27:40

Q. Okay.

A. But I have not seen a listing of those things that -- to answer your question directly, have I seen a list with Neil Benowitz's name on it which states and so on? No, I haven't seen a list like that at all. But I understand that he has been involved in some of this. 17:27:44 17:27:46 17:27:50 17:27:52 17:27:54 17:27:56

Q. Okay. Would you disagree with Dr. Benowitz's testimony that it hasn't been proven that nicotine is more rapidly delivered to the brain as a function of the pH of mainstream cigarette smoke? 17:28:04 17:28:08 17:28:12 17:28:16

MS. WALBURN: Objection to the form of the question and assumes facts not in evidence. 17:28:18 17:28:20

THE WITNESS: I guess I could see what he said as far as what he said and where he said it. 17:28:24 17:28:28

BY MR. KEMNA:

Q. At this time do you have a reason to disagree with Dr. Benowitz's opinion? 17:28:30 17:28:32

MS. WALBURN: Objection, the question has been asked and answered, and improper form of the question. 17:28:34 17:28:38 17:28:38

THE WITNESS: I really need to see what he said in the context of what he said and how he said it. So if you have got something that we could look at I could tell you how I would interpret that, if that's indeed what he said. 17:28:40 17:28:42 17:28:46 17:28:50 17:28:50

BY MR. KEMNA:

Q. Is it your position that Dr. Benowitz is in a lesser state of knowledge with respect to this issue than you are? 17:28:54 17:28:58 17:28:58

MS. WALBURN: Objection, calls for speculation. 17:29:00 17:29:00

THE WITNESS: I really don't know. I don't know which documents he has had a chance to review, what he has looked at. I really don't know. 17:29:04 17:29:06 17:29:12 17:29:12

I guess what I have seen here is pretty revealing and has not been common knowledge amongst the scientific community to the extent and to the degree to which the tobacco industry has known about the pH manipulation to increase the delivery of nicotine across the biological membranes -- to increase the absorption of nicotine across the biological membranes. 17:29:16 17:29:22 17:29:24 17:29:28 17:29:38 17:29:40

That's -- they have obviously been interested in that a long time. 17:29:42 17:29:44

25 MR. KEMNA: Let's go off the record for 17:29:48

1 just a moment. 17:29:50
2 VIDEOGRAPHER: Temporarily going off the 17:29:52
3 video record. The time is now 5:29 p.m. 17:29:56
4 (A discussion was held off the
5 record.) 17:30:54
6 VIDEOGRAPHER: We are back on the video 17:31:10
7 record. The time is now 5:31 p.m. 17:31:14
8 MR. KEMNA: Doctor, I don't have any 17:31:18
9 further questions. 17:31:20
10 THE WITNESS: Okay. 17:31:20
11 MS. WALBURN: Are we going to continue 17:31:22
12 with other counsel now? 17:31:28
13 MR. PURDY: How much time is left? I 17:31:30
14 mean, should we quit here? 17:31:32
15 MR. McDONNELL: How much time do we have 17:31:36
16 left today? 17:31:36
17 MS. WALBURN: Why don't we take care of a 17:31:38
18 couple administrative matters and then go off the 17:31:42
19 record and talk about the time situation and talk 17:31:44
20 about what we should do for the remainder of the 17:31:44
21 afternoon. 17:31:44
22 Couple of administrative issues. One is 17:31:46
23 that I believe your notice of deposition asked for 17:31:50
24 articles that had been authored by Dr. Hurt and we 17:31:52
25 have a collection to provide counsel (indicating). 17:32:04

And the second issue that arose earlier was the book of internal company documents that Dr. Hurt has. We have a duplicate copy of the documents which we can leave with counsel. 17:32:08 17:32:12 17:32:14 17:32:16

It includes the same documents that are under Dr. Hurt's notebook but they may be in different order. As Dr. Hurt worked with them they have been rearranged some but they are the same documents. 17:32:20 17:32:22 17:32:26 17:32:30 17:32:30

MR. GALE: Has he marked the documents in his notebook so that they are any different in any way -- I'm Todd Gale. 17:32:38 17:32:40 17:32:40

Has he marked the documents in his notebook so that they are in any different from the copies you are looking to provide U.S.? 17:32:40 17:32:42

MS. WALBURN: Yeah, I think there are some markings, if you want to spend a couple minutes looking at his notebook at the conclusion. Dr. Hurt wants to take it with him tonight but there is some highlighting, there is some -- there is some marginalia in there, you can take a look at that. 17:32:44 17:32:46 17:32:48 17:32:52 17:32:54 17:32:58

MR. GALE: Okay. 17:32:58

MS. WALBURN: And maybe we can either go off the record or stay on the record in terms of talking about the time issue. 17:33:06 17:33:10 17:33:12

The issue hasn't arisen in expert depositions before about how to deal with colloquy and that sort of thing. I hope it doesn't become an issue; I think we can probably work this out. 17:33:16 17:33:20 17:33:22 17:33:24

There hasn't been very much colloquy in today's session, and if -- you know, if we can agree that we are basically going to be guided by the realtime time notations and -- you know, I don't think -- I hope we don't get into a situation where we have to count seconds and minutes. 17:33:26 17:33:30 17:33:32 17:33:38 17:33:42 17:33:44

I think that you probably understand with your expert depositions coming up getting 12 hours of testimony in a day makes for long days and if we can agree on some contours that are going to guide everyone through the expert deposition process, if you want to think about that overnight we can talk about it tomorrow morning. 17:33:46 17:33:48 17:33:52 17:33:54 17:33:56 17:33:58 17:34:00

MR. GALE: Let me ask this question, and I hope I am not jumping in front of any of my other counsel. 17:34:04 17:34:08 17:34:08

How much time do you believe -- well, let me ask it a different way. Do we have six full hours tomorrow or something less? 17:34:10 17:34:14 17:34:16

MS. WALBURN: Well, I think we have gone over six hours today so you would have something 17:34:18 17:34:22

less, and we can tally it up right now and see if we can reach agreement on it. 17:34:24 17:34:26

MR. PURDY: Let me just -- we really shouldn't get into a fight about the time on these things, but let me just make a comment generally. 17:34:28 17:34:32 17:34:34

I mean, I am going to be at the end of this thing and I have got some questions to ask and I don't think that the doctor has to sit here for 13 hours or 14 hours or even 12 and a half hours necessarily, but -- 17:34:38 17:34:42 17:34:44 17:34:46 17:34:48

MS. WALBURN: He is not going to. 17:34:50

MR. PURDY: No, no, Roberta, I hear what you are saying, and let me just say at the same time -- and I haven't interjected myself today, but there has been so much -- there has been so much in the form of speeches and non-responsiveness that -- and just as a matter of courtesy, I think the doctor is entitled to -- he can say whatever he wants to say. 17:34:52 17:34:54 17:34:56 17:34:58 17:35:02 17:35:06 17:35:08 17:35:08

But, I mean, I have listened all day long to the same speech over and over again, not responsive to the questions. And I don't want that time to be eaten up. 17:35:12 17:35:14 17:35:16 17:35:18

Now, I don't want to go to court and say, Judge, look, go read the transcript and, you know, 17:35:20 17:35:24

I -- we were at the end of 12 hours and I didn't get my chance to ask some questions and, you know -- I don't want to get into that fight. 17:35:26 17:35:30 17:35:30

And I don't think that we are necessarily going to end up going over 12 hours at all, I don't 17:35:32 17:35:36

mean that. But why -- why can't we just come in here tomorrow, let's sit down, let's get going, let's see how far we get, and hopefully, we don't get in a fight and hopefully we're done. 17:35:40 17:35:42 17:35:44 17:35:46

MS. WALBURN: Well, I think yours was the longest speech of the day, other than maybe Mr. McDonnell's when he was accusing U.S. of not listing a document. 17:35:48 17:35:50 17:35:52

MR. PURDY: I didn't make any speech. 17:35:54

MS. WALBURN: Well, I think the record would reflect differently. Look, let's -- I hope we don't get into this tomorrow. 17:35:56 17:35:58 17:35:58

The fact is that you may characterize his answers one way. You are wrong, and the record speaks for itself. And if you got a problem with it you can go to the Court, because I think that there can be no dispute that when the witness is testifying that counts against the clock. 17:36:00 17:36:04 17:36:06 17:36:08 17:36:12 17:36:14

MR. LOSS: Excuse me. I didn't mean to interrupt. 17:36:16 17:36:16

MS. WALBURN: And if you are going to bring up what's happened in fact deposition, we are in a different situation here. 17:36:20 17:36:22 17:36:24

Mr. Monica refused to agree with U.S. that the same rules applied in fact depositions and expert depositions. 17:36:24 17:36:26

Again, I think you should think about it 17:36:28

overnight and see if you got a position in the morning. Hopefully, we won't run into a problem. 17:36:30 17:36:32

We are finishing this deposition tomorrow. We got more than six hours of testimony in today. We can tally it up in a minute. 17:36:34 17:36:36 17:36:36

MR. LOSS: Is that with or without colloquy? 17:36:38 17:36:42

MS. WALBURN: There has been very little colloquy. The longest speeches have been by defense counsel, and I have been raising objections from time to time that have been very short. 17:36:44 17:36:50 17:36:50 17:36:52

So if you want to go back and add up the colloquy and start getting into a fight about seconds and that sort of thing, you know, be my guest, go ahead and do it, and we can fight about this tomorrow morning. 17:36:54 17:36:56 17:36:56 17:36:58 17:36:58

The fact is that we have had six hours and 18 minutes of testimony by the court reporter's and 17:37:00 17:37:02

videographer's time count. 17:37:06

You know, we haven't had a problem in the expert depositions to date. We are not going to let an expert witness sit here for eight hours and go on and on and on. 17:37:08 17:37:12 17:37:16 17:37:16

Let's just pick up tomorrow morning and move -- we got through a lot of territory today and I see no reason why tomorrow is not going to be any different. 17:37:18 17:37:20 17:37:24 17:37:24

MR. McDONNELL: Can we start at 8:30 17:37:28

tomorrow morning? 17:37:28

MS. WALBURN: Yes. Let's start at 8:30. 17:37:32

Off the record. 17:37:32

VIDEOGRAPHER: This concludes the fourth 17:37:36
tape in the videotaped deposition of Dr. Richard 17:37:38
Hurt. The time is now 5:37 p.m. 17:37:42

(The deposition was recessed at 5:37 p.m. and
David Jenkins, having first been duly sworn,
certifies that the proceedings have been recorded
accurately and that the video accurately reflects
such recording.)

DEPOSITION CORRECTION SHEET

CASE TITLE: TOBACCO LITIGATION
DEPOSITION OF: RICHARD HURT, M.D., VOL. I
DATE TAKEN: August 19, 1997

PAGE	LINE	DESIRED CHANGES	REASON

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Deponent's Signature _____

Subscribed and sworn to before:
_____, a Notary Public, County of _____, State of _____, on _____, 1997.

Return to: Kathy L. Soper
Ray J. Lerschen & Associates
620 Plymouth Building
12 S. Sixth Street
Minneapolis, MN 55402

STATE OF MINNESOTA)
) ss
COUNTY OF HENNEPIN)

BE IT KNOWN THAT I, KATHY L. SOPER, took the DEPOSITION of RICHARD HURT, M.D., VOLUME I;

THAT, I was then and there a notary public in and for the County of Hennepin, State of Minnesota;

THAT, I exercised the power of that office in taking said deposition;

THAT, by virtue thereof I was then and there authorized to administer an oath;

THAT, said witness, before testifying, was duly sworn to testify to the truth, the whole truth, and nothing but the truth, relative to this action;

THAT, said witness reserved the right to read and sign the deposition;

THAT, said record is a true record of the testimony given by the witness;

THAT, I am neither attorney nor counsel for, nor related to or employed by any of the parties to this action in which this deposition is taken and, further, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, or financially interested in this action.

WITNESS MY HAND AND SEAL this _____ day of _____, 1997.

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Kathy L. Soper, CSR, RPR, Notary Public

21 Hennepin County, Minnesota

My commission expires January 31, 2000.np

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